YEAR 1979
DATE 12-28
TIDE 0.4
TIME 1:51 PM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-2 20

AT-2 20

		● BARNACLES Balanus-Chthamalus					Littorina scutulata			
m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1									
	2	12	2				2			
	3									
	4	60								
	5						1			
2	6	3								
	7	50					7			
	8	20	1				1			
	9	8					1			
	10	65	5				27			
3	11						12			
	12	4								
	13	20	4							
	14	5					8			
	15									
4	16						9			
	17	6					2			
	18	24								
	19									
	20						4			
5	21	1								
	22	12					13			
	23	10					15			
	24	25	3				7			
	25	2					19			
6	26									
	27						5			
	28	7	1				4			
	29	35					6			
	30	5					4			
7	31									
	32	6	2							
	33	9					13			
	34									
	35	1					11			
8	36	5					1			
	37	2					8			
	38	2					6			
	39						4			
	40	40					12			
9	41									
	42	15					2			
	43	8					7			
	44	20					14			
	45	10	1				16			
10	46									
	47	6	1				2			
	48	25	2							
	49									
	50	2	1				3			

	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia spp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	
m²		●		x x	x x ●	●			●	●	x							m²
1 25		15							4	48								1
2 25		4								28								2
3 5										12								3
4 20		3							7	54								4
5 1		1							1	24								5
6 1		5								27								6
7 16		3							2	42								7
8 20		17			2	1			3	62								8
9 1		2							1	40								9
10 1		9							3	43								10

SIZE AVERAGE : 2 .....
% YOUNG :
P = PRESENCE
TW - 76 CUR.

```
-       1•2          Φ 6
     1979•           Φ 6
-     12•28          Φ 6
      0•0000         ∧
          2•         •
          1•         •
          7•         •
          1•         •
          1•         •
         27•         •
         12•         •
          8•         •
          9•         •
          2•         •
          4•         •
         13•         •
         15•         •
          7•         •
         19•         •
          5•         •
          4•         •
          6•         •
          4•         •
         13•         •
         11•         •
          1•         •
          8•         •
          6•         •
          4•         •
         12•         •
          2•         •
          7•         •
         14•         •
         16•         •
          2•         •
          3•         •
         32•         t₁₁ /
         18•         Σ₁₁ /
         50•         A
      1•9600         •
-     1•••••         •
    246•0000         •
   3060•0000         •
      6•1439         •
      4•9200         •
      3•2169         A
      6•6230         A

      0•0000         ∧
      4•0000         •
      7•0000         •
      1•0000         •
      2•0000         •
      3•0000         •
      1•0000         •
      3•0000         •
      7•0000         t₁₁ /
      3•0000         Σ₁₁ /
     10•0000         A
      2•2620         •
-     1•••••         •
     21•0000         •
     89•0000         •
      2•2335         •
      2•1000         •
      0•5023         A
      3•6976         A
```

LIT

Col

YEAR 1980
DATE 1-14
TIDE -0.2
TIME 3:08 PM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-7 20

AT-7 20

		Balanus-Chthamalus BARNACLES				Littorina scutulata				ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.					
m²	dm²	LIVE	DEAD	SCAR	mm SIZE	●				● m²		●		××	××●	●			●	●	●						COMMENTS	m²
1	1					1				1 10		25				2				23								1
	2					1																						
	3					4																						
	4					8																						
	5					3																						
2	6					1				2 10		85							2	43								2
	7					14																						
	8					3																						
	9					8																						
	10					21																						
3	11					4				3 1		78							5	11								3
	12					2																						
	13					3																						
	14					4																						
	15					6																						
4	16									4 1		26								23								4
	17																											
	18																											
	19																											
	20					1																						
5	21					2				5 1		71								28								5
	22																											
	23					4																						
	24					7																						
	25					4																						
6	26									6 1		118							3	33								6
	27					13																						
	28																											
	29					1																						
	30					2																						
7	31									7 2		128			1				1	23								7
	32					9																						
	33					8																						
	34																											
	35					2																						
8	36					2				8 5		109			1				4	32	1							8
	37					4																						
	38					8																						
	39					16																						
	40																											
9	41					21				9 1		64							12	31								9
	42					4																						
	43					2																						
	44					23																						
	45					37																						
	46																											
	47																											
	48																											
	49																											
	50																											

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW-76 CUR

```
            1•7          Φ  6
        1980•            Φ  6
-           1•14         Φ  6
            0•0000       ^
            1•0000       •
            1•0000       •
            4•0000       •
            8•0000       •
            3•0000       •
            1•0000       •
           14•0000       •
            3•0000       •
            8•0000       •
           21•0000       •
            4•0000       •
            2•0000       •
            3•0000       •
            4•0000       •
            6•0000       •
            1•0000       •
            2•0000       •
            4•0000       •
            7•0000       •
            4•0000       •
           13•0000       •
            1•0000       •
            2•0000       •
            9•0000       •
            8•0000       •
            2•0000       •
            2•0000       •
            4•0000       •
            8•0000       •
           16•0000       •
           21•0000       •
            4•0000       •
            2•0000       •
           23•0000       •
           37•0000       •
           10•0000       Σ11 /
           45•0000       A
            1•9600       •
-           1•••••       •
          253•0000       •
         3991•0000       •   4T
            7•6404       •
            5•6222       •
            3•3898 3.396 A
            -  8546 4.85 A
```

YEAR 1980
DATE 1-12
TIDE 1.0
TIME 1:42 PM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-10
20

AT-10
20

m²	dm²	● BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE		Littorina scutulata ●			
1	1									
	2	200					5			
	3	500	4				32			
	4	200					3			
	5	300					17			
2	6	80	3				13			
	7	160					8			
	8	140	6				15			
	9	200	5				4			
	10	100	2				11			
3	11	5								
	12	20								
	13	30	2	4						
	14	70					3			
	15	100	6							
4	16	60					2			
	17	9	3				4			
	18	50	2	6			7			
	19	15					5			
	20	200	3				14			
5	21									
	22	50	2				4			
	23	50					1			
	24	70	4				11			
	25	200					10			
6	26						1			
	27	50	2				2			
	28									
	29	4					28			
	30	90	4				6			
7	31									
	32									
	33									
	34									
	35									
8	36						3			
	37	160								
	38									
	39						9			
	40	2					13			
9	41	36					3			
	42	200	4				10			
	43	180	7				4			
	44	12	1				5			
	45	30					2			
10	46	8								
	47	75					2			
	48									
	49	15					1			
	50	100	2				6			

● m²	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp. scabra digitalis	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	Littorina planaxis	COMMENTS	m²
		●	●	●	×	×	×	×	×			●	●				●		
1 25				1								12/88	1						1
2 5												13/135							2
3 5												3/14							3
4 2			37									5/36							4
5 1			198	1								4/96	8				2		5
6 1		5		1								8/84							6
7 2												0/2							7
8 1												4/81							8
9 2			230									9/56							9
10 0			10	1								5/139							10

SIZE AVERAGE : 3 mm
% YOUNG :
P = PRESENCE
TW-76 CUL

```
           1•10        Φ  6
        1980•          Φ  6
-          1•12        Φ  6
           0•0000      Λ
                5•     •
                5•            Σ²N

               21•     Φ  6
             1980•     Φ  6
-               1•     Φ  6
                0•     Λ

                0•     Λ  UT
                5•     •
               32•     •
                3•     •
               17•     •
               13•     •
                8•     •
               15•     •
                4•     •
               11•     •
                3•     •
                2•     •
                4•     •
                7•     •
                5•     •
               14•     •
                4•     •
                1•     •
               11•     •
               10•     •
                1•     •
                2•     •
               28•     •
                6•     •
                3•     •
                9•     •
               13•     •
                3•     •
               10•     •
                4•     •
                5•     •
                2•     •
                2•     •
                1•     •
                6•     •
               34•     t11  /
               16•     Σ11  /
               50•     A
           1•9600      •
-          1•••••      •
         264•0000      •
        3758•0000      •
           6•9459      •
           5•2800      •
           3•3546      A
           7•2053      A

           0•0000      Λ
         100•0000      •
         563•0000      •
        7889•0000      •
     •••••••••••       •
          50•0000      •
         264•0000      •
        3758•0000      •
     •••••••••••       •
         150•0000      •
           1•9600      •
-          3•••••      •
         827•0000      •
       11647•0000      •
           6•8968      •
           5•5133      •
           4•4096      A
           6•6170      A
```

June 4, 2002
A-1
B1 ~ B5
removed for xerox
copies
~~data cards~~ to
give to Peter
Eldredge
McHan

YEAR 1978
DATE 7-8
TIDE -0.2
TIME 8:15 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT BT-2
16

BT-2
16

Balanus-Chthamalus
Littorina sp.
ALGAE %
A. xanthogrammica
A. elegantissima
Pollicipes sp.
Pachygrapsus sp.
Hemigrapsus sp.
Cancer sp.
Pugettia sp.
Pagurus spp.
Mopalia sp.
Mytilus sp.
Platyodon sp.
Collisella spp.
Tegula sp.
Acanthina sp.
Pisaster sp.
Strongylocentrotus sp.
COMMENTS

● PRESENT
BARNACLES

m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1						8			
	2						7			
	3									
	4									
	5									
2	6						32			
	7						19			
	8						28			
	9						14			
	10						10			
3	11						46			
	12						6			
	13									
	14						9			
	15						15			
4	16						21			
	17						24			
	18									
	19						9			
	20						28			
5	21						36			
	22									
	23						8			
	24						14			
	25						52			
6	26						6			
	27						12			
	28									
	29						33			
	30						9			
7	31						4			
	32						26			
	33						4			
	34						13			
	35						11			
8	36						10			
	37						14			
	38						5			
	39						13			
	40						24			
9	41						17			
	42						1			
	43						4			
	44						6			
	45						9			
10	46						8			
	47						15			
	48						1			
	49						3			
	50						8			

● m²		●		×	×	×××	×			●	●	●						COMMENTS m²
1 60						||				33	105	1						1
2 50		2				||				12	42							2
3 30						||				13	40							3
4 35						||				3	36							4
5 20						||				14	11							5
6 20						||				15	28							6
7 25		9				||				11	41							7
8 30		12				||				12	85							8
9 50						||				11	103							9
10 10						||				4	56							10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW - 76 CUR

YEAR 1978
DATE 7-8
TIDE -0.2
TIME 8:15 AM

WATER TEMP. ____
SALINITY ____
OTHER :

STUDY SITE ____
TRANSECT BT-3
16

BT-3
16

m²	dm²	BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

ALGAE % m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS m²
●		●		×	×	×	●	●	×		●	×	●	●						
1 99											2		20							1
2 99											5		33							2
3 99							1				1		46	1						3
4 95							1				1		45							4
5 99								1			1		40	1						5
6 99											2		49	1						6
7 99											1		16	2						7
8 99											1		40	1						8
9 95											3		70	1						9
10 99		25											9	1						10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW-76 CVL

YEAR 1978
DATE 7-9
TIDE -0.0
TIME 8:48 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT BT-4
16

BT-4
16

m²	dm²	BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE
1	1				
	2				
	3				
	4				
	5				
2	6				
	7				
	8				
	9				
	10				
3	11				
	12				
	13				
	14				
	15				
4	16				
	17				
	18				
	19				
	20				
5	21				
	22				
	23				
	24				
	25				
6	26				
	27				
	28				
	29				
	30				
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

m² ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS m²
●		●		××	×××	●	×		●	●	●	×		
1 50						4			76					1
2 50		1				8			96					2
3 50		3				4			53	3				3
4 75		49				9			69	3				4
5 70		6				5			51	1				5
6 65		30				3			65	14				6
7 75		45				5			66	16				7
8 75		69				6			71	15	3			8
9 80		38				3			89	21				9
10 75		40				3			95		16			10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW - 76 CUZ

YEAR 1978
DATE 7-7
TIDE -0.4
TIME 7:42 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-1

CT-1
16

BARNACLES — Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE
1	1				
	2				
	3				
	4				
	5				
2	6				
	7				
	8				
	9				
	10				
3	11				
	12				
	13				
	14				
	15				
4	16				
	17				
	18				
	19				
	20				
5	21				
	22				
	23				
	24				
	25				
6	26				
	27				
	28				
	29				
	30				
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

m² / ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. / Hemigrapsus sp.	Cancer sp. / Pugettia sp. / Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula spp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
●		●			× × ●	●			●	●	●				
1 95		9			|| 12	1			41	30	4				1
2 95		13			|| 17	2			17	22	4				2
3 90		1			|| 5	1			3	14	1				3
4 20					|| 4					9					4
5 90					|| 9	2				17					5
6 80					|| 3					5	6				6
7 95					|| 11					15					7
8 90					|| 6					8	3				8
9 90					|| 8					4	5				9
10 95		1			|| 12	1			1	13	3				10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUL

YEAR 1978
DATE 7-7
TIDE -0.4
TIME 7:42 AM

WATER TEMP. ______
SALINITY ______
OTHER : ● GIANT OWL LIMPET P

STUDY SITE ______
TRANSECT CT-2
16

CT-2
16

BARNACLES Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia spp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	m²
	●									●		●	●	●							
1										335		284	14								1
2	9									7		96	51	1							2
3	11											53	19								3
4	20											45	38	2							4
5	9											4	25	1							5
6	4												7								6
7	4																				7
8													2								8
9	1												2								9
10												3	9								10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW - 76 cuz

YEAR 1978
DATE 7-22
TIDE -1.0
TIME 7:59 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-5 16

CT-5 16

BARNACLES
Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE
1	1				
	2				
	3				
	4				
	5				
2	6				
	7				
	8				
	9				
	10				
3	11				
	12				
	13				
	14				
	15				
4	16				
	17				
	18				
	19				
	20				
5	21				
	22				
	23				
	24				
	25				
6	26				
	27				
	28				
	29				
	30				
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia spp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.			COMMENTS	m²
m²	●					●	●	●							●					m²
1	8																			1
2	11						1	1							2					2
3	19							8							5					3
4	12					1									2					4
5	10														1					5
6	9							5												6
7	7														2					7
8	10					1														8
9	10														1					9
10	14																			10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW - 76 CUR.

YEAR 1978
DATE 7-7
TIDE -0.4
TIME 7:42 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-7 16

CT-7 16

Balanus-Chthamalus

● BARNACLES

m²	dm²	LIVE	DEAD	SCAR	mm SIZE
1	1	60	5		
	2	40			
	3	50	15		
	4	800	100		
	5	350	200	12	
2	6				
	7				
	8				
	9				
	10				
3	11				
	12				
	13				
	14				
	15				
4	16				
	17				
	18				
	19				
	20				
5	21				
	22				
	23				
	24				
	25				
6	26				
	27				
	28				
	29				
	30				
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp. Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	Littorina sp.	COMMENTS	m²
	●		× ×	× × ●			●	●	●			●			
1	9			17			425	114	21			3,500			1
2															2
3															3
4															4
5															5
6															6
7															7
8															8
9															9
10															10

SIZE AVERAGE : 3 mm

% YOUNG :

P = PRESENCE

TW-76 CVL

YEAR 1978
DATE 7-22
TIDE -1.0
TIME 7:59

CT-12
16

WATER TEMP. ______
SALINITY ______
OTHER : ● Saccglossus sp. P

STUDY SITE ______
TRANSECT ______

m²	dm²	BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE
1	1				
	2				
	3				
	4				
	5				
2	6				
	7				
	8				
	9				
	10				
3	11				
	12				
	13				
	14				
	15				
4	16				
	17				
	18				
	19				
	20				
5	21				
	22				
	23				
	24				
	25				
6	26				
	27				
	28				
	29				
	30				
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
1																1
2																2
3																3
4																4
5																5
6																6
7																7
8																8
9																9
10																10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW-76 CUR.

```
  ¦      a      ¦¦b¦¦      c      ¦¦      d      ¦¦      e      ¦f¦      g     ¦¦     h     ¦
 1 DuxA7-68.BOR        Platyodon   Pholadidea      Botula
 2   DuxburyReef   n cancellatus   penita         falcata   ¦   m2 sum
 3        Area A   1       21.000        0.000       0.000¦     21.000
 4     transects   2       64.000        0.000      32.000¦     96.000
 5                 3       11.000       11.000       0.000¦     22.000
 6     July 1968   4        0.000       11.000       0.000¦     11.000
 7                 5       11.000        0.000      32.000¦     43.000
 8      selected   6        0.000        0.000       0.000¦      0.000
 9Boring species   7        0.000        0.000       0.000¦      0.000
10                 8       32.000        0.000      21.000¦     53.000
11       n=10 m2   9        0.000        0.000       0.000¦      0.000
12     transects  10        0.000        0.000       0.000¦      0.000
13
14        sum/sp          139.000       22.000      85.000¦    246.000
15    sum xi2/sp         5803.000      242.000    2489.000¦  14920.000
16
17        AVG/sp           13.900        2.200       8.500¦     24.600
18       Max/col           64.000       11.000      32.000¦     96.000
19       Min/col            0.000        0.000       0.000¦      0.000
20
21   StandardDev           20.739        4.638      14.010¦     31.391
22       95% < M           -0.936       -1.118      -1.522¦      2.144
23       95% M >           28.736        5.518      18.522¦     47.056
                                                                  st e10
```

```
  ¦      a      ¦¦b¦¦      c      ¦¦      d      ¦¦      e      ¦f¦      g     ¦
 1   DuxA7-68.SES       Mytilus      Pollicipes     Anthopleura
 2    DuxburyReef   ncalifornianus polymerus   xanthogrammica¦   m2 sum
 3         Area A   1       832.000      500.000       2100.000¦    3432.000
 4      transects   2         0.000        0.000        300.000¦     300.000
 5                  3       640.000      960.000        300.000¦    1900.000
 6      July 1968   4      1800.000      720.000          0.000¦    2520.000
 7                  5         0.000        0.000        900.000¦     900.000
 8       selected   6       272.000     2440.000         50.000¦    2762.000
 9Sessile Species   7         0.000        0.000       1200.000¦    1200.000
10                  8         0.000        0.000          0.000¦       0.000
11        n=10 m2   9         0.000        0.000          0.000¦       0.000
12      transects  10         0.000        0.000          0.000¦       0.000
13
14         sum/sp          3544.000     4620.000       4850.000¦   13014.000
15     sum xi2/sp       4415808.000 7643600.000    6842500.000¦31707668.000
16
17         AVG/sp           354.400      462.000        485.000¦    1301.400
18        Max/col          1800.000     2440.000       2100.000¦    3432.000
19        Min/col             0.000        0.000          0.000¦       0.000
20
21    StandardDev           592.529      782.387        706.340¦    1281.113
22        95% < M           -69.477      -97.696        -20.295¦     384.930
23        95% M >           778.277     1021.696        990.295¦    2217.870
Formula: g41@                                                       st g15
```

```
 ¦      a      ¦¦b¦     c    ¦¦      d     ¦e¦   f    ¦¦g¦   h    ¦¦   i    ¦j¦
 1 DuxA7-68.SEM    Mopoalia  Strongylocen¦    #m2    *     #1        #2    ¦
 2 Duxbury Reef n    spp.      purpuratus¦    sum    **  (xi)2     (xi)2   ¦
 3      Area A 1       0.000       0.000¦   0.000*    0.000    0.000¦
 4    transects 2       1.000      15.000¦  16.000*    1.000  225.000¦
 5               3       2.000       0.000¦   2.000*    4.000    0.000¦
 6    July 1968 4       0.000       0.000¦   0.000*    0.000    0.000¦
 7               5       0.000       0.000¦   0.000*    0.000    0.000¦
 8     selected 6       3.000       0.000¦   3.000*    9.000    0.000¦
 9 Semi-sessile 7       0.000       0.000¦   0.000*    0.000    0.000¦
10      species 8       0.000       0.000¦   0.000*    0.000    0.000¦
11      n=10 m2 9       1.000       0.000¦   1.000*    1.000    0.000¦
12    transects10       2.000       0.000¦   2.000*    4.000    0.000¦
13                                        transect
14       sum/sp         9.000      15.000¦  24.000*   19.000  225.000*
15 sum (xi)2/sp        19.000     225.000¦ 274.000*
16
17       AVG/sp         0.900       1.500¦   2.400*
18  StandardDev         1.101       4.743¦   4.904*
19                                                     #1 sp    #2 sp
20       95% < M        0.113      -1.893   -1.108     3.000   15.000
21       95% M >        1.687       4.893    5.908     0.000    0.000
22      Variance        1.211      22.500   24.044
23        95%(t)        2.262       2.262    2.262     -p-      -q-
                                                              sem d4
```

```
 ¦      a      ¦¦b¦¦     c    ¦¦d¦   e    ¦¦    f    ¦¦    g    ¦¦    h    ¦¦    i    ¦
 1  DuxA7-68.MOB      Tegula     ¦   (xi)2
 2  Duxbury Reef  n  funebralis ¦
 3        Area A  1      10.000¦   100.000
 4                2       8.000¦    64.000
 5     July 1968  3      50.000¦  2500.000
 6                4      39.000¦  1521.000
 7Mobile species  5      31.000¦   961.000
 8                6      42.000¦  1764.000
 9                7       0.000¦     0.000
10      selected  8       0.000¦     0.000
11         10 m2  9       0.000¦     0.000
12      transect 10       0.000¦     0.000
13
14        sum xi        180.000
15     sum (xi2)       6910.000   6910.000
16                                Range
17           AVG         18.000     50.000 Max (xi)
18                                   0.000 Min (xi)
19   StandardDev         20.194
20       95% < M          3.555      2.262 95%(t)
21       95% > M         32.445      3.162 sqrt(10)
22      Variance        407.778     14.445  +/-
23
                                                               mob c9
```

DUXBURY REEF
Area A $5.6 \times 10^4 m^2$
Ten m^2 transect sampling for species of various transects

```
                          DATAFILE b:DuxA7-68

      Sample 1  Sample 2  Sample 3  Sample 4  Sample 5  Sample 6  Sample 7
      PLA       PHO       BOTULA    MOP       TEG       MYT       POL

  1:  21        0         0         0         10        832       500
  2:  64        0         32        1         8         0         0
  3:  11        11        0         2         50        640       960
  4:  0         11        0         0         39        1800      720
  5:  11        0         32        0         31        0         0
  6:  0         0         0         3         42        272       2440
  7:  0.        0         0         0         0         0         0
  8:  32        0         21        0         0         0         0
  9:  0         0         0         1         0         0         0
 10:  0         0         0         2         0         0         0
 11:
  Σ =  139       22        85        9         180       3544      4620
NO.      10        10        10        10        10        10        10
MEAN  13.90000  2.200000  8.500000  0.900000  18.00000   354.400   462.000
MED   5.500000  0.000000  0.000000  0.500000  9.000000  0.000000  0.000000
SDEV  20.73885  4.638007  14.00992  1.100505  20.19351   592.529   782.387
```

```
                          DATAFILE b:DuxA7-68

      Sample 8  Sample 9
      STR       AXA

  1:  0         2100
  2:  15        300
  3:  0         300
  4:  0         0
  5:  0         900
  6:  0         50
  7:  0         1200
  8:  0         0
  9:  0         0
 10:  0         0
 11:
   Σ = 15        4850
NO.      10        10
MEAN  1.500000   485.000
MED   0.000000   175.000
SDEV  4.743417   706.340
```

```
                          DATAFILE b:DuxA7-68

      Sample 1  Sample 2  Sample 3  Sample 4  Sample 5  Sample 6  Sample 7
      Platyodon PholadideaBotula    Mopalia   Tegula    Mytilus   Pollicipes

  1:  21        0         0         0         10        832       500
  2:  64        0         32        1         8         0         0
  3:  11        11        0         2         50        640       960
  4:  0         11        0         0         39        1800      720
  5:  11        0         32        0         31        0         0
  6:  0         0         0         3         42        272       2440
  7:  0.        0         0         0         0         0         0
  8:  32        0         21        0         0         0         0
  9:  0         0         0         1         0         0         0
 10:  0         0         0         2         0         0         0
 11:

NO.     10        10        10        10        10        10        10
MEAN  13.90000  2.200000  8.500000  0.900000  18.00000   354.400   462.000
MED   5.500000  0.000000  0.000000  0.500000  9.000000  0.000000  0.000000
SDEV  20.73885  4.638007  14.00992  1.100505  20.19351   592.529   782.387
```

```
                          DATAFILE b:DuxA7-68

      Sample 8  Sample 9
      Strongylo Axanthogr

  1:  0         2100
  2:  15        300
  3:  0         300
  4:  0         0
  5:  0         900
  6:  0         50
  7:  0         1200
  8:  0         0
  9:  0         0
 10:  0         0
 11:

NO.     10        10
MEAN  1.500000   485.000
MED   0.000000   175.000
SDEV  4.743417   706.340
```

Ten Square Meter Transect sampling
Species from Area A, Duxbury Reef
July 1968

Species	Mean per Square Meter	95% Confidence Interval
Boring Species		
Platyodon cancellatus boring shale clam	13.9	-0.9 to 28.7
Pholadidea penita boring piddock	2.2	-1.1 to 5.5
Botula falcata boring razor clam	85.0	-1.5 to 18.5
Sessile Species		
Mytilus californianus sea mussel	354.4	-69.4 to 778.2
Pollicipes polymerus goose barnacles	462.0	-97.6 to 1021.6
Anthopleura xanthogrammica giant green anemone	485.0	-20.2 to 990.2
Balanus spp. acorn barnacle	Present in large numbers	
Semi-sessile species		
Mopalia spp. chiton	0.9	0.1 to 1.7
Strongylocentrotus purpuratus purple sea urchin	1.5	-1.8 to 4.9
Mobile Species		
Tegula funebralis black turban snail	18.0	3.5 to 32.4

TABLE . Ten square meter Sampling of Area A transects, Duxbury Reef, July 1968

Ten Square Meter Transect sampling
Intertidal and Subtidal
July 9, 1968: -1.8 @ 5.54 A.M.

Species	Mean per Square Meter	95% Confidence Interval
Boring Species		
Platyodon cancellatus boring shale clam	5.2	0.90 to 9.4
Pholadidea penita boring piddock	9.2	0.02 to 18.3
Phragmatopoma californica black tube worm	Present	
Sessile Species		
Mytilus californianus sea mussel	138.0	18.1 to 257.8
Pollicipes polymerus goose barnacles	37.5	6.8 to 68.2
Anthopleura xanthogrammica giant green anemone	2.6	-0.2 to 5.4
Balanus spp. acorn barnacle	Present in large numbers	
Semi-sessile species		
Mopalia spp. chiton	0.4	-0.1 to 0.9
Strongylocentrotus purpuratus purple sea urchin	4.2	-0.4 to 8.8
Mobile Species		
Tegula funebralis black turban snail	2.8	-1.7 to 7.3
Pisaster ochraceus purple starfish	0.1	-0.1 to 0.3

TABLE . Intertidal-Subtidal Sampling, 10 m2 transect sampling at South Bolinas Point

Duxbury, Area A; Transects of July, 1968. 1968

(Area of Area A = $5.6 \times 10^4 m^2$) = 56,000 m^2

Ten m^2 - Summary of Transects

Species	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	Totals
* Platyodon	21	64	11	0	11	0	0	32	0	0	139
* Pholadidea	0	0	11	11	0	0	0	0	0	0	22
* Botula falcata razor clam	0	32	0	0	32	0	0	21	0	0	85
Mopalia spp	0	1	2	0	0	3	0	0	1	2	~~10~~ 9
Tegula funebralis	10	8	50	39	31	42	0	0	0	0	180
Mytilus californianus	832	0	640	1800	0	272	0	0	0	0	3544
Pollicipes polymerus	500	0	960	720	0	2440	0	0	0	0	4620
Strongylocentrotus purpuratus	0	15	0	0	0	0	0	0	0	0	15
Anthopleura xanthogrammica	2100	300	300	0	900	50	1200	0	0	0	4850

file: DUXA7-68

1968 Measurements

Area A = $5.6 \times 10^4 \, m^2$

Dux 1968

Area A, m² ~~#~~	Platyodon	Botula	Pholadidea
X_1	21	0	0
X_2	64	32	0
X_3	11	0	11
X_4	0	0	11
X_5	11	32	0
X_6	0	0	0
X_7	0	0	0
X_8	32	21	0
X_9	0	0	0
X_{10}	0	0	0
Total	139	85	22
$\bar{X}$	17.4	10.6	2.8
S^2	183.25	110.43	6.48

Method: Measuring live organisms in rock-surface aperture -

Day

Area A	Strongylocentrotus purpuratus
X 1	0
2	15
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
	15

1968

Tegula funebralis

Dux A.

AT-1

X1	10
2	8
3	50
4	39
5	31
6	42
7	0
8	0
9	0
10	0

T: 180

Dux 1968

Area A

	Mytilus californianus	
M^2	↓	Pollicipes polymerus
X^1	832	500
X^2	~~500~~ 0	0
X^3	640	960
X_4	1800	720
X_5	0	0
X_6	222	2440
X_7	0	0
X_8	0	0
X_9	0	0
X_{10}	0	0
Total:	~~1744~~ 3544	4620

Dux 1968

No. of M², X_i

Mopalia mucosa + M. lignosa

Area A

X_1	0
X_2	1
X_3	2
X_4	0
X_5	0
X_6	3
X_7	0
X_8	0
X_9	1
X_{10}	2
X_{11}	1
X_{12}	2
X_{13}	1
	13

Area A 44. m^2	Pisaster ochraceous
1 —	0
}	
25	1
}	
38	2
}	
44	0
	Total. 3

Dec -1968

~~m²~~

~~21~~

Area	No. of m²	X_1	No. of Species Anthopleura elegantissima	A xantho
A	21	1	2100 ←	
		2	300	
		3	300	
		4	0	
		5	900	
		6	50	
		7	1200	
		8	0	2
		9	0	1
		10	0	2
		11	300	
		12	50	
		13	0	
		14	300	
		15	4800	
		16	30	
		17	4500	
		18	0	
		19	300	
		20	0	1
		21	300	

subtidal Haliotis rufescens

ΣBP-~~SS~~-5

	sex	x̄ length	Rings	Color	
11/2/71	2M,3F	7 5/8"	10–19	5 white	from 10 (Barge)

11/2/71 Haliotis rufescens

BP ~~SS~~ 5
subtidal
random sampling
−1,3 @ 4:23 AM

Small flood channel held many old red abalone, mostly 7", 10 yrs or older

Estimate 10-15 HAL/m², some stacked 3 deep

Sex	Length	Rings	Color	tagged
M	8"	12+	white	
F	7-5/8"	19+	"	
M	7"	too scarred	"	
F	7-3/4"	10+	"	
F	7-5/8"	13+	"	
Σ 2M, 3F	—	10–19	5	
X̄ =	7 5/8"	13.5		

1.4 CONTROL

DUXBURY REEF
DX-AT-4

oil		TEG	ACM	LIT	POL	MOP	PIS	XI ACA	XI MYT			
	6/3/69	199	850	1500	200	3	1	26	12			
	7/1/69	203	820	1500	200	0	0	14	0	CAN		
	8/1/69	272	820	1500	200	1	2	0	0	1	~~PAG~~	OTHER
	(4/1/71)	~~37~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~24~~	~~XI 7 Anthopleura~~
	(7/1/71)										PAG	
N	8/9/71	37	0	0	0	0	0	0	0	0	24	XI 7 Anthopleura
N	11/16/71	0	0	0	0	0	0	0	0	0	31	14 Anthopleura 1 Leptasterias
N	1/14/72	41	0	0	0	0	1	9	0	2	25	10 Anthopleura
N	4/30/72	18,5D	3,1D	3	0	0	0	0	0	0	13	?
N	6/30/72	0	0	0	0	0	1	0	0	0	39	21 Anthopleura

1975 no count

So. Bolinas Point July 9, 1968 -1.8 @ 5:54 AM

The Air Port Reef Ten m² ~~Samples~~ Intertidal - Subtidal Transect — sampling at the Air Port Reef 1968

file SoBP 7-68

Species	Y_1	X_2	Y_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	avg/m²
* Platyodon cancellatus boring shale clam	6	12	13	7	14	0	0	0	0	0	
* Pholadidea penita boring piddock	0	0	28	36	8	2	12	0	6	0	
Strongylocentrotus purpuratus purple sea urchin	0	0	0	0	0	0	3	18	11	10	
Anthopleura xanthogrammica giant green anemone	0	0	0	0	1	2	1	12	7	3	
③ Mopalia spp chiton	1	0	2	1	0	0	0	1	0	0	
① Mytilus californianus sea mussel	0	0	0	0	0	310	450	200	120	300	
② Pollicipes polymerus goose barnacle	0	0	0	0	0	50	100	75	100	50	
Tegula funebralis black turban snail	0	0	20	6	2	0	0	0	0	0	
Pisaster ~~orchraceus~~ ochraceus purple starfish	0	0	1	0	0	0	0	0	0	0	
Pachygrapsus crassipes striped shore crab	0	1	1	2							
Balanus spp, acorn barnacle	+ ~~present in large numbers~~						+	+	+	+	
Phragmatopoma californica black tube worm	0	0	0	0	0	0	0		+	+	
~~Algae: Corallina~~ or Pterogophora } or											

6 ft below m² No. 10.

a. Planted ~~18~~ ten, 7-8½" abs tagged w/ plastic yellow tag.

b. On Nov 2, 1971 Observed 5 of the tagged abalones.

c. On two other dives, 1974 and 1976 / no abalones were observed. — 0

d. Fragment of one abalone shell observed on Feb 11, 1986 after Salt Barge — 0

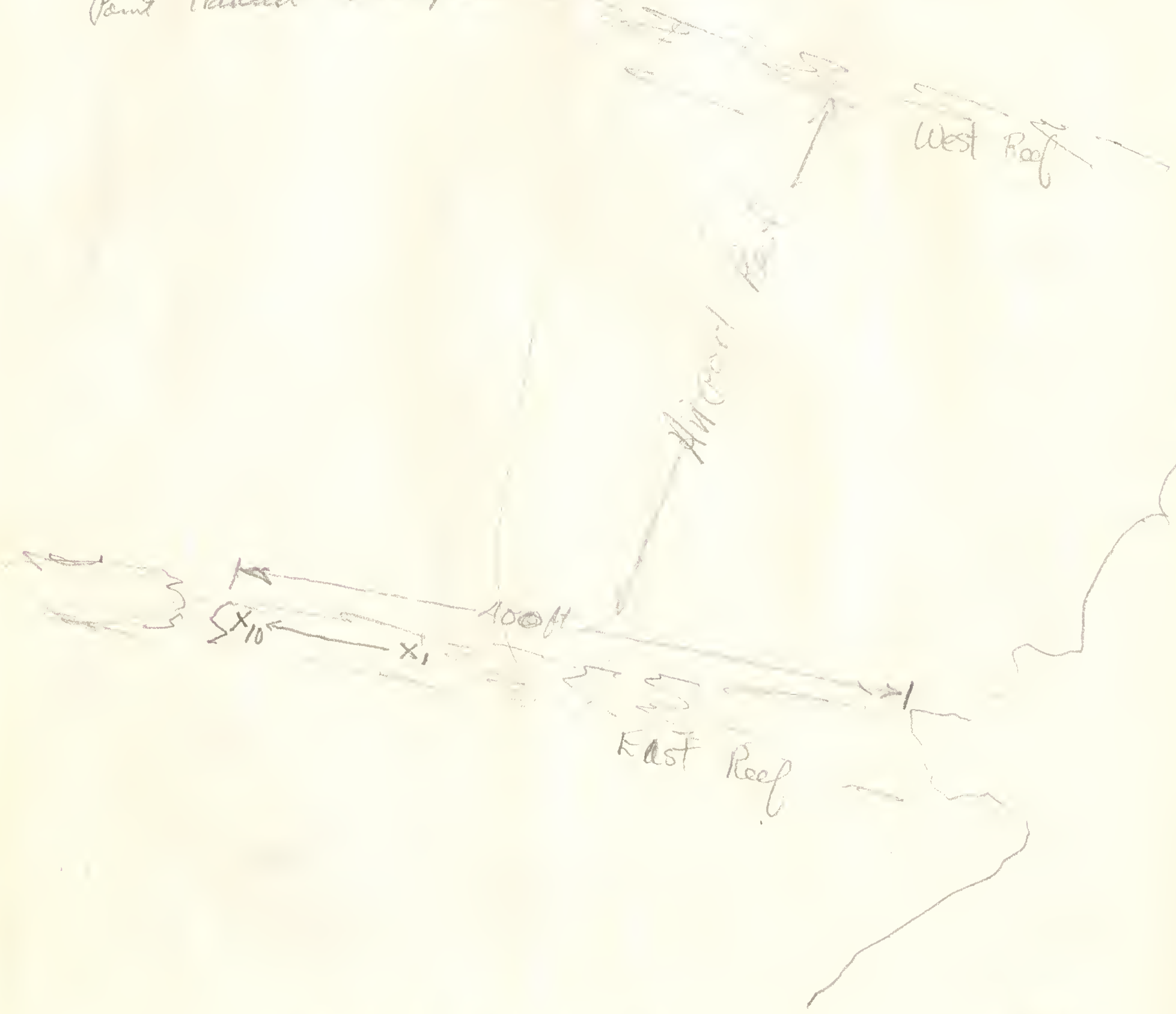
e. No abalones observed in 10 dives on the Salt Barge area 11/2 & 11/12/1986 = 0

July 9, 1968
Tide -1.8 @ 5:54 AM.

Planted 10 abs @ Bolinas Point at X_{10} in crevices @ sub-tidal depth of six feet.

Objectives

Planted + distributed 50 abalones through Duxbury Reef - Bolinas Point Transect sites; 25 abs @ Shark Tooth Rock, Area C.



South Bolinas Point - Ab. Transect

Sco. Bolivar Point 10 m²; July 9, 1968 Tide -1.8 @ 5:54 am

M²	Zone 1		Zone 2		Zone 3			Zone 4			
	Balanus	[illegible]	Tegs	Pachy	Mop	Hda	Platys	Antho xant	Mytilus	Poll	Strong
X_1	present		0		1	0	6		2	1	0
X_2	"		0	1	0	0	12				0
X_3	"		20	1	2	28	13				
X_4	"		6	2	1	36	7		1 present		
X_5	"		2			8	17	1			
X_6	"		0			2		2	1 present		
X_7	"		0			12		1	310	50	3
X_8	"		0		1	0		12	450	100	18
						6		7	200	75	
X_9	"	x	3			0			120	100	11
X_{10}	"	+	0			0		3	300	50	10
Totals			31	4	5	92	52	26	1380	375	42

much Corallina algae
good Pterygophora at zone 4

planted
+ 10 abs @
6 feet in
10 M²

MEASUREMENTS OF BERM EROSION, HEERD

June 1, 1977 - May 12, 1978

DISTANCE in meters (
from location pint to edge of berm

1 9 7 7		1 9 7 8	
Aug 4	Oct 10	Feb 2	Mar 30
1.375m	1.25m	1.25m	0.875m
1.5	1.25	1.25	1.0
1.875	1.875	1.875	1.875
1.875	1.875	1.875	1.875
2.0	2.0	2.0	2.0
2.75	2.5	2.5	2.5
2.625	2.5	2.5	2.5
2.5	2.25	2.0	2.0
0.5	0.5	0.125	0.125
0.625	0.5	0.375	0.25
0.625	0.5	-0.125	-0.125
0.75	0.25	0.25	0.25
2.375	2.25	2.0	1.875
2.5	2.5	2.0	2.0
2.125	2.0	2.0	1.875
2.0	2.0	2.0	1.75
2.0	1.5	1.375	1.375
0.25	-0.5	-0.5	-0.75
-0.25	-0.5	-1.25	-1.25
-0.625	-0.75	-1.125	-1.125
-0.125	-1.25	-1.25	-1.25
-0.125	-1.0	-1.0	-1.0
0.0	-0.375	-0.375	-0.375
0.125	-0.125	-0.5	-0.5
1.0	0.0	-0.25	-0.625
2.0	0.5	0.0	0.0
2.25	0.75	0.25	0.25

```
0• C
0• C
0•375+
0•25+
0•125+
0•125+
0•125+
0•125+
0•125+
0•5+
0•125+
0•125+
0•25+
0•375+
0•25+
0•25+
0•25+
0•125+
0•125+
0•375+
0•25+
0•5+
0•625+
0•875+
                22
6•25+I
6•25÷
31•+
                01
31•+I
625•÷
31•+
                01
31•+I
0• C
6•25÷
31•=
0•20161290322+I
```

```
0•625+
0•875+
0•25+
0•375+
0•5+
0•625+
0•125+
0•625+
1•+
0•625+
1•+
0•875+
0•625+
0•75+
0•25+
0•25+
0•875+
1•75+
1•25+
0•875+
1•5+
1•25+
1•+
0•875+
1•625+
2•+
2•25+
0•375+
1•+
1•875+
1•625+
                31
29•5+I
29•5000000000÷
31•=
0•95161290322+I
```

Location
Points on
Transect

Pole 3	June 1	Dec 6	May 12	12/6/77-5/12/78	6/1/77-5/12/78
#0	1.5m	1.25m	0,875m	0.375	0.625m
1	1.875	1.25	1.0	0.25	0.875
2	2.0	1.875	1.75	0.125	0.25
3	2.125	1.875	1.75	0.125	0.375
4	2.5	2.0	2.0	0.0	0.5
5	3.0	2.5	2.375	0.125	0.625
6	2.625	2.5	2.5	0.0	0.125
7	2.625	2.0	2.0	0.0	0.625
8	1.0	0.125	0.0	0.125	1.0
9	0.875	0.375	0.25	0.125	0.625
10	0.625	-0.125	-0.625	0.5	1.0
11	1.125	0.25	0.25	0.0	0.875
12	2.5	2.0	1.875	0.125	0.625
13	2.75	2.0	2.0	0.0	0.75
14	2.125	2.0	1.875	0.125	0.25
15	2.0	2.0	1.75	0.25	0.25
16	2.0	1.5	1.125	0.375	0.875
17	1.0	-0.5	-0.75	0.25	1.75
18	0.0	-1.0	-1.25	0.25	1.25
19	-0.5	-1.125	-1.375	0.25	0.875
20	0.25	-1.25	-1.25	0.0	1.5
21	0.25	-1.0	-1.0	0.0	1.255
22	0.5	-0.375	-0.5	0.125	1.0
23	0.25	-0.5	-0.625	0.125	0.875
24	1.0	-0.25	-0.625	0.375	1.625
25	2.0	0.25	0.0	0.25	2.000
26	2.5	0.75	0.25	0.5	2.25
27	2.0	1.625	1.625	0.0	0.375
28	2.5	2.125	1.5	0.625	1.0
29	2.0	1.0	0.125	0.875	1.875
30	2.125	0.5	0.5	0.0	1.625

See new App. 13.

APPENDIX 13 LIVE and DEAD COUNTS FOR OIL EXPOSURE LABORATORY TESTS, November 17, 1971

SPECIES	CONTROL TANKS			CONDITIONED TANKS			UNCONDITIONED TANKS			TOTAL ALL TANKS		
	live	dead	% dead	live	dead	% dead	live	dead	% dead	live	dead	% dead
Balanus glandula	54	2	4%	69	44	39%	92	21	19%	215	67	23%
Pollicipes polymerus	64	36	36%	143	9	6%	32	64	67%	239	109	31%
Mytilus californianus	30	0	0%	30	0	0%	30	0	0%	90	0	0%
Pachygrapsus crassipes	5	0	0	4	1	20%	5	2	28%	14	3	18%
Hemigrapsus nudus	1	0	0%	1	0	0%	0	0	0%	2	0	0%
Acmaea digitalis	4	2	33%	4	2	33%	4	2	33%	12	6	33%
Acmaea scabra	6	0	0%	4	2	0%	1	5	82%	11	7	39%
Tegula funebralis	26	0	0%	26	0	0%	26	0	0%	78	0	0%
Totals and overall %	190	40	17%	281	58	17%	190	94	33%	661	192	22%
										Total-oil tanks		
Barnacles, mussels and limpets				250	57	19%	159	92	37%	409	149	27%
Crabs and snails				31	1	3%	31	2	6%	62	3	5%

Craig Heacox

OIL EXPOSURE TEST
RECORD OF DEATHS

FIG # 3

L = LIVING
D = DEAD

			CONTROL TANKS #1 & #7					CONDITIONED OIL TANKS #2 & #5					UNCONDITIONED OIL TANKS #3 & 6					NUMBER OF INDIVIDUALS PER SPECIES						
			3 Nov	9	17	24	1 Dec	3 Nov	9	17	24	1 Dec	3 Nov	9	17	24	1 Dec	3 Nov	9	17	24	1 Dec	TOTAL	
[illegible]	Sub Total	L	6	6	[illegible]	3	3	30	25	23	21	21	[illegible]	21	[illegible]	22	22						72	
		D	0	0	1	2	0	0	5	2	2	0	0	7	0	7	0						26	
	Sub Total	L	50	50	[illegible]	41	41	83	56	46	30	30	77	[illegible]	[illegible]	63	63						210	
		D	[illegible]	[illegible]	1	8	0	0	21	6	16	0	0	14	0	0	0						76	
	Total	L	56	56	[illegible]	44	44	113	77	69	51	51	113	92	[illegible]	85	85	282	225	215	180	180	282	[illegible] SURVIVAL
		D	0	0	[illegible]	10	0	0	36	8	18	0	0	21	0	7	0	0	57	10	35	0	102	[illegible]
[illegible]	Sub Total	L	[illegible]	[illegible]	[illegible]	0	0	63	55	54	21	0	57	5	0	0	0						149	
		D	0	23	[illegible]	0	0	0	8	[illegible]	33	21	0	58	[illegible]	0	0						128 149	
	Sub Total	L	81	63	64	50	43	89	89	89	89	85	[illegible]	37	32	23	11						199	
		D	0	3	0	14	7	0	0	0	0	4	0	0	1	9	12						60	
	Total	L	114	99	64	50	43	152	144	142	110	105 85	36	38	[illegible]	23	11	348	259	239	183	~~160~~	348	[illegible] SURVIVAL
		D	0	23	13	14	7	0	8	1	33	4 25	0	58	0	9	12	0	89	20	56	~~25~~ 44	188 209	[illegible]
[illegible]		L	5	5	5	5	4	5	5	4	3	3	7	7	5	4	4							
		D	0	0	0	0	1	0	0	1	1	0	0	0	2	1	0							
	Total	L	5	5	5	5	4	5	5	4	3	3	7	7	6	4	4	17	17	14	12	11	17	[illegible] SURVIVAL
		D	0	0	0	0	1	0	0	1	1	0	0	0	2	1	0	0	0	3	2	1	6	
[illegible]		L	1	1	1	1	1	1	1	1	1	1	0 →											
		D	0	0	0	0	0	0	0	0	0	0												
	Total	L	1	1	1	1	1	1	1	1	1	1						[illegible]	[illegible]	2	2	2	[illegible]	[illegible]
		D	0	0	0	0	0	0	0	0	0	0						0	0	0	0	0	[illegible]	
[illegible]	Sub Total	L	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15							
		D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
	Sub Total	L	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15							
		D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
	Total	L	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	90	90	90	90	90	90	[illegible]
		D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
[illegible]		L	6	5	5	4	4	6	4	4	3	3	[illegible]	4	4	4	3							
		D	0	1	1	0	0	0	2	0	1*	0	0	2	0	0	1*							
	Total	L	[illegible]	5	5	4	4	6	4	4	3	3	6	4	4	4	3	18	13	12	11	10	18	[illegible] SURVIVAL
		D	0	1	1	0	0	0	2	0	1	0	0	2	0	0	1	0	5	1	1	1	8	
[illegible]		L	6	6	6	6	6	6	4	4	4	4	6	2	1	1	1							
		D	0	0	0	0	0	0	2	0	0	0	0	4	1	0	0							
	Total	L	6	6	6	6	6	6	[illegible]	4	4	4	6	2	1	1	1	18	12	11	11	11	18	[illegible] SURVIVAL
		D	0	0	0	0	0	0	2	0	0	0	0	4	1	0	0	0	6	1	0	0	7	[illegible]
[illegible]		L	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26							
		D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
	Total	L	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	78	78	78	78	78	78	[illegible] SURVIVAL
		D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NUMBER OF LIVE ORGANISMS PER TEST TANK			[illegible]	[illegible]	[illegible]	166	158	337	[illegible]	[illegible]	228	224 203	[illegible]	199	190	173	160	853	696	661	567	542 524		
NUMBER OF DEAD ORGANISMS PER TEST TANK			0	24	16	24	8	0	48	10	53	4 25	0	85	0	17	13	← 311 → 853						

* Died while attached to tank wall well above high water outfall
Probable cause: desiccation

MARINE OIL SPILL STUDY

SHEET - B
cont.

OIL EXPOSURE TEST NOV-DEC 1971

SUMMARY OF SEA WATER TEMPERATURE DATA

Readings taken with a Centigrade Thermometer having 1° graduations.

DATE	BMS Deck	Time	BMS Lab	— outside aquaria
Nov 19	— last entry on Sheet-B			
20				NO DATA
21				" "
22				" "
23	12.00°	17:30	11.25°	.75° cooler
24	11.00	1330	11.50	.50 warmer
25				NO DATA
26	10.75	1600	11.50	.75° warmer
27				NO DATA
28				" "
29	13.00	1500	12.00	1.0 cooler
30	10.50	1100	10.25	.25° cooler
Dec 1	11.00	1700	11.00	same
2	11.50	1700	11.00	.50° cooler
3	10.00	1000	10.00	same

Contents

① Chronological Listing of Events & Data 14 pages

② Sheets - A, B, C page 1 & page 2

③ Fig - 3 - foldout.

Reference is made to Figs 1 & 2 - disregard ~~these~~ Figs are for my ~~info~~ records -

CH.

STUDY

- NOV-DEC 1971

OF EVENTS & DATA.

t of Electrical & Mechanical
Intermatic Time Switch, model
ter a solenoid valve to obtain
del cycles per 24 hour period.
ble trippers which were
. With this arrangement
hieve a reasonable
l cycles common to the
Duxbury ([illegible] area.

SOLENOID VALVE: A "Green Lawn" sprinkler valve was used. This valve, as its trade name suggests, is a lawn sprinkler valve. It is designed to be activated by a timer switch. It operates on 24 volts, so it was necessary to utilize a transformer that would step down from 110 volts to the required 24 volts. The valve has a plastic body and a synthetic rubber diaphram.

It is not designed to operate with sea water. There are metal parts that do have contact with the fluid passing through the line. During a 3 week period of continuous duty, the valve only malfunctioned once. On this occasion some silt or detritus had lodged in the

MARINE OIL SPILL STUDY
OIL EXPOSURE TEST - NOV-DEC 1971

CHRONOLOGICAL LISTING OF EVENTS & DATA.

10/25 Preparation for Test

#. Start operational Test of Electrical & Mechanical controls: TIMER - An Intermatic Time Switch, model #T101, was used to activate a solenoid valve to obtain the required number of tidal cycles per 24 hour period. This switch has 4 adjustable trippers which were set at 6 hour intervals. With this arrangement it was possible to achieve a reasonable duplication of the tidal cycles common to the Duxbury Reef area.

SOLENOID VALVE: A "Green Lawn" sprinkler valve was used. This valve, as it trade name suggests, is a lawn sprinkler valve. It is designed to be activated by a timer switch. It operates on 24 volts, so it was necessary to utilize a transformer that would step down from 110 volts to the required 24 volts. The valve has a plastic body and a synthetic rubber diaphram.

It is not designed to operate with sea water. There are metal parts that do have contact with the fluid passing through the line. During a 3 week period of continuous duty, the valve only malfunctioned once. On this occasion some silt or detritus had lodged in the contact area, however this problem was easily solved.

The valve was installed on one of the BMS's 1" PVC sea water lines. On the exhaust side of the valve a 1" PVC ball valve was installed, to reduce the pressure against the smaller PVC "Chemcock" valves and the 1/2" flexable hose and pressure fittings that were used to meter and pass sea water to the test tanks. PVC "Chemcock" valves were also used at the low water outfall on each test tank because this was an easy method of obtaining the desired rate of vertical movement of the sea water.

The following tide cycle was started on this date and was maintained throughout the experiment:

PACIFIC STANDARD TIME	PACIFIC DAYLIGHT SAVING TIME	TIDAL CYCLE
0500	0600	FLOOD
1100	1200	EBB
1700	1800	FLOOD
2300	2400	EBB

#

② Began collecting test organisms. 4 species of crustaceans and 4 species of molluscs were collected and used in this experiment. All are locally common and were well represented in the littoral portions of the Bolinas area during the Standard Oil spill of Jan 1971. The folling is a list of organisms collected: (See sheet-A or insert sheet-A here) XXXXXXXXXXXX

The 2 species of crabs and B. glandula were taken from Bolinas Lagoon, all of the other species were taken from Duxbury Reef - BMS designated Area B.

10/27 All test organisms collected and held in various holding tanks so that they could begin their conditioning to the simulated tide cycle

10/31 Change from Pacific Daylight Saving Time to Pacific Standard Time

11/1 Pre-test organism count made (See datum on sheet-A or on FIG-3) and orgaims arranged in their assigned test tanks: Tanks #1, 2 & 3 were setup to contain the less active sessile organisms. These organisms are all either filter feeders or grazers. Tanks #5, 6 & 7 were set up to contain the active and predatory crabs. With this arrangement, the possibility of death due to predation was limited to as few organisms as possible, the crabs themselves. Also, it was felt that with the added demands imposed by the experiment, the crabs would not be too inclined to cannibalize themselves. By isolating the crabs it was possible to achieve an undisturbed oil film movement over all the other test organisms during the rise and fall of the sea water level. It was also possible to obtain a clear delineation of the intertidal and subtidal interphase in tanks 2&3. This is important, because one of the objectives of this test is to determine whether there is a significant difference between the survival rates of organisms that have had contact with the asphalt-like portion of Bunker C, and those that have only been exposed to the more aromatic portions.

The sessile organisms destined for constant intertidal exposure were positioned on stacks of inverted biological dishes. B. glandula was found, in situ, encrusting a PVC pipe having a 12" diameter. From this pipe, an 8" length was cut and quartered, and 3 8"x10" sections were placed in the test tanks. The organisms inhabiting the lower 3"x10" area of each section make up

The subtidal group and the organisms covering the remaining 5"x10" area comprised the intertidal group

11/2 1700 hrs — Bunker C conditioning began. A quantity of this fuel oil was poured into a container supplied with running sea water in such a manner that a constant water level could be maintained. The Bunker C formed a film over the water, presumably, allowing the more aromatic portions to evaporate from the surface or to be carried away with the water current.

On Jan 19, 1971, the Bunker C that reached the Bolinas Bay area had been afloat for 24 to 30 hours. To reproduce this condition, the Bunker C conditioning period was scheduled for 30 hours.

11/3 2300 hrs — Beginning of - 1st TEST PERIOD - 5½ DAYS - from WED. NOV 3 - at 2300 hrs to TUE. NOV 9 at 1100 hrs. During the 5½ day period someone was on duty for a 2 hours, 4 times a day. These watches began 1 hour before a tidal change and continued until one hour after. In this way back up control could be maintained if the automatic controls malfunctioned.

The temperature of the sea water passing through the test tanks never varied more than 1.50°C from the water temperature at the BMS's intake on Bolinas Lagoon. (see sheet-B or insert data from sheet-B)

The sea water system at BMS is unfiltered so that all test animals could receive food during the test. In addition the crabs in Tank #7 were given pieces of mussels or marine worms twice a week. Twice weekly feeding of others began Nov 19 - 1100hs

START TEST - Conditioned Bunker C was introduced into oil exposure tanks #2 & #5. Unconditioned Bunker C, that is, Bunker C taken straight from Standard Oil's sample container, was introduced into oil exposure tanks #3 & #6. In both cases, 50 ml of Bunker C was carefuly poured into 50 or 100 ml graduated cylinders. Then these cylinders were hung in an inverted position over the selected tanks and allowed to drain. The pouring began during the simulated high tide and continued during the simulated ebb tide. At no time was Bunker C allowed to come in contact with control tanks #1 or #7.

11/4 0500hrs - OBSERVATIONS: All organisms in simulated intertidal zones of oil exposure tanks #2,3,5 & 6 subjected to probable contact with Bunker C. "Many organisms covered with oil.

1100hrs - OBSERVATIONS: Visibility in oil exposure tanks very poor - no other expressable data.

1700hrs - OBSERVATIONS: Organisms again subjected to oil contact - no other expressable data.

2300hrs - Observation times scheduled for 2300 & 1100 each day. During these periods several specimens of all species were prodded with a length of thin wire.

Throughout this account, organisms or species not mentioned are presumed to be doing well. Normally organisms in control tanks are not discussed

OBSERVATIONS: Changes in some organisms behavior easily observable.

T. funebralis (Tank #3) 8 specimens upturned on tank bottom, apparently attempting to right themselves, but unable to do so - very active

P. polymerus - no observable response to prodding.

11/5 - OBSERVATIONS:

1100hrs T. funebralis (Tank #3) - 7 specimens upturned on tank bottom, but less active than those observed earlier. 1 of these specimen with operculum closed.

(Tank #2) - 4 specimens upturned on tank bottom - not so active - same as those in tank #3.

A. digitalis (Tank #3) - 1 specimen, alive, attached, but slow response to prodding.

A. scabra (Tank #3) - 1, dead, upturned on tank bottom. 1, alive, attached, slow to respond, shell raised approx 3/16" above substrate surface.

(Tank #2) - 2, dead, upturned on Tank bottom.

Crabs - all crabs are apparently equally quick in their response to prodding and to the usual kinds of human movement around and above their tanks.

(Tanks #5 & 6) - The Bunker C doesnt seem to stick to the crabs in large clots. All crabs are covered with a very fine oil film that only slightly masks the markings on their exoskeleton. It is mostly on the blunt tips of their eye stalks, on the chelae, and the most distal leg segments that the film is thick enough to appear black and completely mask the crabs color pattern or disguise the form of the exoskeleton - However, during the time of low water these crabs move their appendages in such a manner so as to fold the oily film on the water's surface, much as one folds egg whites, with the distressing result that they gather the viscous scum to themselves. With characteristic movements of their chelae, they then direct this gathered asphaltic solid to their external mouth parts. These oral appendages become blackened and gummed in their turn. Then the poor crabs make their other characteristic gesture, that of removing the tary substance from their oral region by picking at it with a slotted chela. By these motions a micro current is developed which causes more oil to puddle around their faces. It is much like putting molasses on a babys finger tip, handing him an eider down feather, and letting him amuse himself.

Apparently much of the oil is floated off the crabs with the rising of the water level during the next simulated flood tide.

2300 hrs - OBSERVATIONS:

T. funebralis (Tank #3) - 8 upturned as previously described.
(Tank #2) 5 - (ditto)

A. digitalis - (Tank #3) - 1 - alive, attached, responds very poorly to touch
(Tank #2) - 1 - (ditto)

P. polymerus (Tank #3) 1 - dead (not collected)
Connective tissue around the scuta and terga relaxed enough to pry inside organism decomposing nicely

(All tanks) - Subtidal groups seem more sluggish.

NOTE: All dead organisms are collected during scheduled observation periods, except for the barnacles. These 2 species could not be observed accurately enough to be consistant in determining morbidity under the prevailing visual conditions in the oil exposure tanks.

11/6 - OBSERVATIONS:
1100 hrs
T. funebralis - (Tank #3) - 8 upturned on tank bottom
While observing this tank one Tegula was seen to have difficulty moving over an oil covered portion of a glass tank wall. The organism lost its hold on the glass

and fell to the bottom of the tank and remained in an upturned position during the remainder of the observation period.

(Tank #2) 5 upturned on tank bottom

A. digitalis (Tank #3)-1 alive, attached, reaction to prodding almost nil.

1 alive upturned on tank bottom reaction so poor that it was presumed dead, collected and labled.

(Tank #2) -1, alive, weakly attached in simulated intertidal zone. This specimen was observed to have had slow reaction time during previous observation period (11/5 . 2300)

M. californianus - (All tanks) No observable difference in the production of fecal pellets.

2300 hrs - OBSERVATIONS: This is the first observation period when enough oil has been removed from the water surface to achive fairly good visibility. (For oil sample data see SHEET-C or include SHEET-C here)

T. funebralis (Tank#3) - 6, upturned on tank bottom; 2 with opercula closed

(Tank#2) - 2, upturned on tank bottom, very active

A. digitalis (Tank#3) - 1 lge specimen known never to have left the intertidal zone observed to be mired in the oil on the glass tank wall - reaction to probing slow.

(Tank#2) - 1, dead, upturned on tank bottom.

A. scabra (Tank#3) - 1, dead, empty shell upturned on tank bottom.

P. polymerus (Tank#3) - Response to probing with wire seems slower than response of sister groups in other tanks.

11/7 1100 hrs - OBSERVATIONS: In all oil exposure tanks, visibility through the water surface is not as good as previously recorded. However, visibility through the glass sides is improved. This is because, during the last simulated flood tide, oil that had been accumulating on the tank walls was lifted to the surface of the water.

T. funebralis (Tank#3) - 8 upturned on tank bottom, 2 with opercula closed.

(Tank#2) - 3 upturned on tank bottom, very active

A. scabra (Tank #3) - 1 dead, upright position, on top of biological dish stack; known to be member of intertidal group.

P. polymerus (Tank #3) - Group reaction to proding very weak. However 2 individuals in the intertidal group gave prompt and strong reactions.

(Tank #2) - 1 dead, subtidal group (not collected) Group reaction to proding very week, however, several individuals in the intertidal group gave prompt and strong reactions

2300 hrs - OBSERVATIONS:

T. funebralis - (Tank #3) - 5, upturned on tank bottom - active

(Tank #2) - 3, upturned on tank bottom - active

P. polymerus - (Tank #3) 2, dead, decomposing (not collected)

Intertidal group - response to proding much improved generally.

Sub tidal group - some individuals react well, others more slowly.

11/8 - OBSERVATIONS:

1100 hrs T. funebralis (Tank #3) - 2, upturned on tank bottom, active

(Tank #2) - 3, (ditto)

A. digitalis (Tank #3) - 1, dead, upturned on tank bottom. This specimen known to have held an intertidal position throughout the test. (see comments 11/7-2300 hrs)

A. scabra (Tank #3) 1, dead, upturned on tank bottom

P. polymerus (Tank #3) - 3 known dead, sub tidal group. None of the members of this group respond to probing.

2300 hrs - OBSERVATIONS:

T. funebralis (Tank #3) 2, upturned on tank bottom - active
(Tank #2) 2, (ditto)

11/9 1100 hrs - OBSERVATIONS: No upturned T. funebralis in either oil exposure tank.

End of 1st test period with first post oil exposure organism count. Summary on data sheets, FIG #1 and FIG #3.

Begining of 2nd Test Period - 8 days from TUE. NOV. 9 - 1100 hrs to WED, NOV. 17 - 1100 hrs.

No regularly scheduled observation times were scheduled during this test period, and no special watches were kept.

11/17 1100 hrs - ¶ End of 2nd Test Period with second post exposure organism count. The findings are summerized on data sheets, FIG #2 and FIG #3

Begining of 3rd Test Period - 7 days from WED. NOV 17 - 1100 hrs to WED. NOV. 24 - 1100 hrs.

Marine Oil Spill Study

~~Tidal Rock Program~~

OIL EXPOSURE TEST - NOV-DEC 971

SHEET-A

Species List. -

	Pre Test count.
Crustaceans	
Barnacles	
Blanus glandula	282
Polycipies polymerus	348
Crabs	
Pachygrapsus crassipes	17
Hemigrapsus oregonensis	2
Mollusca	
Pelecypoda	
Mytilus californianus	90
Gastropods	
Limpets	
Acmaea digitalis	18
Acmaea scabra	18
Snails	
Tegula funebralis	78

MARINE OIL SPILL STUDY

SHEET - B

OIL EXPOSURE TEST - NOV DEC 1971

SUMMARY OF SEA WATER TEMPERATURE DATA

Readings taken with a Centigrade Thermometer having 1° gradations.

	Date	BMS Dock	TIME	BMS Lab- outside aquaria	
P. Carey, & Smith.	3	14.25	1600	15.25	1° warmer
	4	11.25	1130	12.25	1° "
	5	12.50	1400	12.50	same
C. Hansen		11.50	2300	11.50	↓
	6	11.50	1100	11.50	
		11.00	2300	11.00	
	7	11.00	1100	11.00	
		11.25	2300	11.25	
	8	11.00	1100	10.75*	.25° cooler
		11.00	2300	11.00	same
	9	11.25	1300	11.25	↓
P. Carey and Smith	10	12.00	1230	13.00	1° warmer
	11				NO DATA
	12	13.75	1600	14.75	1° warmer
	13	14.25	1330	15.25	1° "
	14	11.25	1330	12.25	1° "
	15				NO DATA
	16	11.00	1200	12.00	1° warmer
	17	12.00	1600	12.00	same
	18	12.00	1530	13.50*	1.50° warmer
	19	11.00	1200	11.50	.50° "
	20				
	21				

MARINE OIL SPILL STUDY

SHEET-C
page 1 of 2

OIL EXPOSURE TEST - NOV-DEC 1971

SUMMARY OF OIL SAMPLE DATA

A record was kept of changes in the visual appearance of the Bunker C used in the oil exposure tanks. The sampling method was quite simple. One 2x3 card was dipped through the water surface of each oil exposure tank during times of high water. Oil adhered to these cards when they were removed. They were then placed on a larger card, labeled and stored in a freezer. The sampling schedule is as follows:

START	Fri	Nov 5 -	1100 hrs.	(3rd DAY)
			2300	
	Sat	" 6 -	1100	
			2300	
	Sun	" 7 -	1100	
			2300	
	Mon	" 8 -	1100	
	Tue	" 9 -	1100	
	Wed	" 10 -	1100	
	Thurs.	" 11 -	1100	

A sample was also taken directly from the original oil container on the first day of the test.

SHEET - C
page 2
of 2

For the first 3 days of the test, no oil was allowed to escape from any tank. After that time, small amounts were allowed to over flow each day until the end of the first part of the test on Nov 9. After Nov 9 the tanks were allowed to overflow at will.

The general appearance of the oil on the sample cards indicates that, after the 3rd day of the test, there was a steady and fairly even decrease in the quantity of oil that the organisms were subjected to during each succeeding low water.

YEAR 1978
DATE 7-21
TIDE -1.3
TIME 7:14 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-3
16

AT-3
16

BARNACLES
Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE
1	1				
	2				
	3				
	4				
	5				
2	6				
	7				
	8				
	9				
	10				
3	11				
	12				
	13				
	14				
	15				
4	16				
	17				
	18				
	19				
	20				
5	21				
	22				
	23				
	24				
	25				
6	26				
	27				
	28				
	29				
	30				
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.		Pachygrapsus sp. / Hemigrapsus sp.			Cancer sp. / Pugettia sp. / Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.			COMMENTS	
● m²		×		×	●	●	●	●	●		●	✖	●	●							m²
1 95						1							32								1
2 99											7		43	1							2
3 90					1			7			3		36								3
4 95								5	1		2		31	1							4
5 100							1	6			3		16	1							5
6 100							1	1			3		17	1							6
7 98							1	2	2		1		17	1							7
8 99											2		9								8
9 95								2	1				28								9
10 100								3					38	1							10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW - 76 CUL

```
  ¦      a      ¦¦b¦      c      ¦¦       d      ¦e¦    f     ¦¦g¦    h     ¦¦     i     ¦j¦
 1 Duxbury Reef    Platyodon    cancellatus¦    #m2     *     #1             #2      ¦
 2  AT3-7172.PL n #1 7-23-71   #2 6-30-72 ¦    sum     **   (xi)2         (xi)2     ¦
 3               1        0.000          6.000¦    6.000*     0.000      36.000¦
 4 Duxbury AT-3 2        1.000          8.000¦    9.000*     1.000      64.000¦
 5               3        2.000          6.000¦    8.000*     4.000      36.000¦
 6    Two 10-m2 4        0.000          4.000¦    4.000*     0.000      16.000¦
 7    samplings 5       10.000         10.000¦   20.000*   100.000     100.000¦
 8               6        3.000          7.000¦   10.000*     9.000      49.000¦
 9               7        7.000          8.000¦   15.000*    49.000      64.000¦
10  n = 10 m2    8       12.000         16.000¦   28.000*   144.000     256.000¦
11               9        0.000          3.000¦    3.000*     0.000       9.000¦
12              10        8.000          2.000¦   10.000*    64.000       4.000¦
13                                            transect
14        sum/sp         43.000         70.000¦  113.000*   371.000     634.000*
15 sum (xi)2/sp         371.000        634.000¦ 1815.000*
16
17        AVG/sp          4.300          7.000¦   11.300*
18  StandardDev           4.547          4.000¦    7.732*
19                                                          #1 sp       #2 sp
20       95% < M          1.047          4.139     5.769    12.000      16.000
21       95% M >          7.553          9.861    16.831     0.000       2.000
22      Variance         20.678         16.000    59.789
23        95%(t)          2.262          2.262     2.262     -p-         -q-
                                                                     st * c11
```

YEAR 1979
DATE 6-15
TIDE -0.7
TIME 9:59 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-2 19

AT-2 19

		Balanus-Chthamalus BARNACLES					Littorina sp.			
m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1	75	8				5			
	2	72	2				3			
	3	30	7				19			
	4	15	40				4			
	5	100	12				5			
2	6									
	7	35	13				1			
	8	10	6				2			
	9	30	4				2			
	10	8					1			
3	11	2								
	12	80					2			
	13	5	2				13			
	14	12					3			
	15	10					4			
4	16						9			
	17	4					2			
	18						1			
	19	3								
	20	8					4			
5	21	4	2	1						
	22	80	3				5			
	23						1			
	24									
	25									
6	26						3			
	27	2								
	28	9					4			
	29	13								
	30									
7	31						2			
	32	12								
	33	20	4				4			
	34	75	2				1			
	35	120	9	3			6			
8	36									
	37	40								
	38									
	39	45	3				1			
	40									
9	41	5					2			
	42	12					1			
	43						1			
	44	100	2	1			5			
	45									
10	46									
	47	7					1			
	48	18								
	49	10					1			
	50									

ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS
● m²		●		× ×	× × ●	×			●	●	●						m²
1 3									2	15							1
2 10					2					42							2
3 2					2					38							3
4 5		c			6				8	92							4
5 5		2			5				3	79	2						5
6 1					2				1	70							6
7 1		1							1	13							7
8 1		10			3				1	55							8
9 1		2			4					96	5						9
10 5		1			2					103							10

SIZE AVERAGE : 3mm
% YOUNG :
P = PRESENCE
TW - 76 CVR

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        1•2          Φ  6
     1979•           Φ  6
-       6•15         Φ  6
        0•0000       ^
             5•      •
             3•      •
            19•      •
             4•      •
             5•      •
             1•      •
             2•      •
             2•      •
             1•      •
             2•      •
            13•      •
             3•      •
             4•      •
             9•      •
             2•      •
             1•      •
             4•      •
             5•      •
             1•      •
             3•      •
             4•      •
             2•      •
             4•      •
             1•      •
             6•      •
             1•      •
             2•      •
             1•      •
             1•      •
             5•      •
             1•      •
             1•      •
            32•      t11  /
            18•      Σ11  /
            50•      A
        1•9600       •
-       1•••••       •
      118•0000       •
      888•0000       •
        3•5269       •   UT
        2•3600       •
        1•3823       A
        3•3376       A

        0•0000       ^
        2•0000       •
        8•0000       •
        3•0000       •   Col
        1•0000       •
        1•0000       •
        1•0000       •
        6•0000       t11  /
        4•0000       Σ11  /
       10•0000       A
        2•2620       •
-       1•••••       •
       16•0000       •
       80•0000       •
        2•4585       •
        1•6000       •
-       0•1586       A
        3•3586       A
```

YEAR 1978
DATE 8-7
TIDE 0.4
TIME 8:12 AM

WATER TEMP.
SALINITY
OTHER :

STUDY SITE
TRANSECT AT-2 16

AT-2 16

m²	dm²	● BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE		Littorina scutulata ●			
1	1	2					10			
	2	12	1				30			
	3	8	1				28			
	4						4			
	5	2								
2	6	1	1				3			
	7	1					17			
	8	2					6			
	9									
	10						3			
3	11									
	12	25					3			
	13	15					1			
	14	9	12				5			
	15						13			
4	16									
	17	2	4				15			
	18	4					7			
	19	5								
	20	2	1	2			11			
5	21	7					13			
	22						4			
	23	16					1			
	24	20	2				11			
	25	30					2			
6	26						1			
	27						1			
	28	5					2			
	29	3					6			
	30						3			
7	31									
	32	4					7			
	33	35	2				9			
	34	8					2			
	35						1			
8	36						2			
	37	90	4				12			
	38						14			
	39						1			
	40	3					3			
9	41						5			
	42	6					2			
	43	12	5				8			
	44	40	5				2			
	45	30	25				9			
10	46	14					2			
	47									
	48	2								
	49									
	50	6	2				4			

● m²	ALGAE %	A. xanthogrammica ●	A. elegantissima	Pollicipes sp. ×	Pachygrapsus sp. Hemigrapsus sp. ×	Cancer sp. ×	Pugettia sp. ×	Pagurus spp. ●	Mopalia sp. ●	Mytilus sp.	Platyodon sp.	Collisella spp. ●	Tegula spp. ●	Acanthina sp. ●	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	m²
1 0		1						1					120								1
2 1								2	1				62	1							
3 1		2						1				1	27	1							3
4 1		8							1				185	1							4
5 1		2						1				1	134	1							5
6 0								2					126								6
7 1		2						2					113	1							7
8 0		7											85								8
9 0		3						1				2	134	3							9
10 1		3											117	1							10

SIZE AVERAGE : 3mm
% YOUNG :
P = PRESENCE
TW - 76 CUL

```
           1•2       Φ  6
       1978•         Φ  6
-          8•7       Φ  6
           0•0000    ∧
             10•     •
             30•     •
             28•     •
              4•     •
              3•     •
             17•     •
              6•     •
              3•     •
              3•     •
              1•     •
              5•     •
             13•     •
             15•     •
              7•     •
             11•     •
             13•     •
              4•     •
              1•     •
             11•     •
              2•     •
              1•     •
              1•     •
              2•     •
              6•     •
              3•     •
              7•     •
              9•     •
              2•     •
              1•     •
              2•     •
             12•     •
             14•     •
              1•     •
              3•     •
              5•     •
              2•     •
              8•     •
              2•     •
              9•     •
              2•     •
              4•     •
             41•     t₁₁  /
              9•     Σ₀   /
             50•     A
          1•9600     •
-         1•••••     •
        283•0000     •    LT
       3791•0000     •
          6•6841     •
          5•6600     •
          3•8072     A
          7•5127     A

          0•0000     ∧
          1•0000     •
          1•0000          Σ²_N
          1•0000     •
          2•0000     •
          7•0000     Σ₀   /
         10•0000     A
          2•2620     •
-         1•••••     •    CoL
          4•0000     •
          6•0000     •
          0•6992     •
          0•4000     •
-         0•1001     A
          0•9001     A
```

0 DUXBURY CT-4
musselbed

1978 July 22

$\bar{X} = 597/50 = 11.9/\text{dm}^2$

4, 4
5

7
8, 8
9, 9
10, 10, 10, 10, 10, 10, 10, 10
11, 11 median mode
12, 12, 12, 12, 12, 12, 12, 12, 12, 12
13, 13, 13, 13, 13, 13, 13
14, 14, 14, 14
15, 15, 15, 15
16

18, 18
19

21
22

YEAR 1978
DATE 7-22
TIDE -1.0
TIME 7:59 am

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-4
16

CT-4
16

m²	dm²	● BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE	● Mytilus sp.		● Tegula sp.	● Thais sp.	● Littorina sp.	● m² ALGAE %
1	1	250	10			12		2		7	1 40
	2	300	40			12			2		
	3	160	7			14		2		5	
	4	200	50			10			1		
	5	350	25			13		1	1	14	
2	6	75	8	2		12				2	2 70
	7	140	12			11		3		5	
	8	50	10	1		13		1	1	5	
	9	200				12		2		1	
	10	110	24			14		2		9	
3	11	180	5			10		4	1		3 75
	12	200	13			13		1		6	
	13	150	20			15		3	2	2	
	14	175	8	4		13		3		11	
	15	40				8					
4	16	90				14		1		5	4 75
	17	130	10			11		5		1	
	18	200				12		1	1		
	19	200	25			10		3	1		
	20	75	3			4		2		3	
5	21	120	50			19			1		5 60
	22	100	14			12		2			
	23	35				7		2	1		
	24	50	6			5		1	2		
	25	140				12		3			
6	26	70	5	3		8		3		3	6 25
	27	110				15		5	1	8	
	28	40				12			1		
	29	150	30			12		1		5	
	30	50	4					1	1		
7	31	140	12			10		4			7 70
	32	250	5			13		2	1		
	33	100				10		1		4	
	34	60	10			12		3	3	1	
	35	120				9		3		1	
8	36	200	15			16			1	12	8 80
	37	140	50	9		18		6	1	7	
	38	75				14		2	1	2	
	39	160	20			15		5		8	
	40	120				4		2			
9	41	250	18			10		5			9 50
	42	300	45	5		9		2	2	4	
	43	120	7			10		2			
	44	180	10			13					
	45	75	2			10		3	2		
10	46	200	10	2		22		1		2	10 50
	47	175	10			18		4	1		
	48	250	8	2		21		2		5	
	49	160	20			15		2		3	
	50	100				13		2	1	5	

A. xanthogrammica	A. elegantissima	● Pollicipes sp.	X ● Pachygrapsus sp. Hemigrapsus sp.	XXX Cancer sp. Pugettia sp. Pagurus spp.	DEAD ● Mopalia sp.	Mytilus sp.	Platyodon sp.	● Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	m²
		12		||	5			42									1
		8		||	8			26									2
		3		||	5			19									3
		3		||	6			23									4
		190		||	2			31									5
		10		||	11			29									6
				||	4			40									7
		10		||	8			17									8
				||	5			30									9
		32		||	7			35									10

SIZE AVERAGE : 2-3 mm
% YOUNG :
P = PRESENCE
TW - 76 CUZ.

YEAR 1978
DATE 8-7
TIDE 0.4
TIME 8:12 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-7
16

AT-7
16

m²	dm²	Balanus-Chthamalus BARNACLES LIVE	DEAD	SCAR	mm SIZE				Littorina scutulata ●	
1	1								3	
	2								3	
	3									
	4								1	
	5								1	
2	6									
	7								2	
	8								4	
	9									
	10								1	
3	11								3	
	12									
	13									
	14								2	
	15									
4	16								1	
	17								1	
	18									
	19								4	
	20								1	
5	21									
	22								2	
	23									
	24									
	25								2	
6	26									
	27								3	
	28									
	29									
	30									
7	31									
	32								1	
	33									
	34								7	
	35									
8	36								2	
	37									
	38								1	
	39									
	40									
9	41								1	
	42									
	43								4	
	44								1	
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.		Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
m²	●		××	×	●	●	●			●	●	●				m²
1	29					1				4	42					1
2	72									11	38					2
3	84					2				5	63					3
4	57					1				3	95	(1)				4
5	70					4	1			2	56					5
6	113					2				4	61					6
7	132				1	2	1			1	84	(3)				7
8	86					5				3	49					8
9	63					1				7	55					9
10																10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW-76 CUL

```
            1•7           Φ   6
        1978•             Φ   6
-           8•7           Φ   6
            0•0000        Λ
            3•0000        •
            3•0000        •
            1•0000        •
            1•0000        •
            2•0000        •
            4•0000        •
            1•0000        •
            3•0000        •
            2•0000        •
            1•0000        •
            1•0000        •
            4•0000        •
            1•0000        •
            2•0000        •
            2•0000        •
            3•0000        •
            1•0000        •
            7•0000        •
            2•0000        •
            1•0000        •
            1•0000        •
            4•0000        •
            1•0000        •
           22•0000        Σ()  /
           45•0000        A
            1•9600        •
-           1•••••        •
           51•0000        •
          163•0000        •
            1•5462        •   LT
            1•1333        •
            0•6815        A
            1•5851        A
           1•7          Φ  6
        1978•           Φ  6
-          8•7          Φ  6
           0•0000       Λ
          29•0000       •
           1•0000       A
          72•0000       •
           0•0000       A
          84•0000       •
           2•0000       A
          57•0000       •
           1•0000       A
          70•0000       •
           4•0000       A
         113•0000       •
           2•0000       A
         132•0000       •
           3•0000       A
          86•0000       •
           5•0000       A
          63•0000       •
           1•0000       A
           9•0000       •
           2•3060       •
-          1••••        •
         706•0000       •
       62788•0000       •
          30•4265       •
          78•4444       •   AEL
          55•0565       A
         101•8323       A
-          2••••        •
          19•0000       •
          61•0000       •   crab
           1•6158       •
           2•1111       •
           0•8690       A
           3•3531       A
-          3••••        •
         725•0000       •
       66147•0000       •
          31•1131       •
          80•5555       •
          56•6399       A
         104•4711       A
•••••••••••••           •
           2•3060       •
           0•9737       A
           0•0262       •
           0•9601       A
           0•9874       A
           0•0125       •
           0•0398       •
```

```
              1•7        Φ 6
          1978•          Φ 6
-             8•7        Φ 6
         0•0000          Λ
        29•0000          •
         1•0000          •
         4•0000          •
        34•0000          A
        42•0000          A
        72•0000          •
         0•0000          •
        11•0000          •
        83•0000          A
        38•0000          A
        84•0000          •
         2•0000          •
         5•0000          •
        91•0000          A
        63•0000          A
        57•0000          •
         1•0000          •
         3•0000          •
        61•0000          A
        95•0000          A
        70•0000          •
         4•0000          •
         3•0000          •
        77•0000          A
        56•0000          A
       113•0000          •
         2•0000          •
         4•0000          •
       119•0000          A
        61•0000          A
       132•0000          •
         2•0000          •
         3•0000          •
       137•0000          A
        84•0000          A
        86•0000          •
         5•0000          •
         3•0000          •
        94•0000          A
        49•0000          A
        63•0000          •
         1•0000          •
         7•0000          •
        71•0000          A
        55•0000          A
         9•0000          •
         2•3060          •
-        1•••••          •
       767•0000          •
     72783•0000          •
        30•4498          •
        85•2222          •
        61•8164          A
       108•6280          A
-        2•••••          •
       543•0000          •
     35541•0000          •
        18•6413          •
        60•3333          •
        46•0043          A
        74•6623          A
-        3•••••          •
      1310•0000          •
    203724•0000          •
        40•3828          •
       145•5555          •
       114•5145          A
       176•5965          A
  •••••••••••            •
         2•3060          •
         0•5854          A
         0•4145          •
         0•5541          A
         0•6168          A
    203724•0000          •
    203724•0627          •
         0•3831          •
         0•4458          •
```

Ths

Tog

YEAR 1978
DATE 8-6
TIDE 0.2
TIME 7:40 AM

AT-8
16

WATER TEMP. ______
SALINITY ______
OTHER : Pachygrapsus = 18 FOR BERM

STUDY SITE ______
TRANSECT AT-8
16

BARNACLES ● Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE	Littorina scutulata ●
1	1	10	1			5
	2	28	5			1
	3	35	2			1
	4	8				9
	5					3
2	6					4
	7	20				
	8	16	1			7
	9	5	8	2		5
	10	30				2
3	11					8
	12	13				19
	13	90	5			11
	14	20				6
	15					2
4	16					7
	17	180	11	5		10
	18	250	4			29
	19	75				14
	20	16	3			9
5	21					5
	22	150	12			11
	23	70	2			8
	24	130	10			5
	25	50				12
6	26	4				4
	27	125	7	1		15
	28	160	24			9
	29	200	6			24
	30	110	15			3
7	31	17	10			12
	32	230	10			7
	33	140	3	2		
	34	350	20			10
	35	225	5	2		
8	36	250	9			14
	37	300	10			5
	38	115	4			21
	39	200				9
	40	160				34
9	41	130				15
	42	40	18			13
	43	110	5			
	44	50				18
	45	65				4
10	46					7
	47	12	2			25
	48	120	8			14
	49	175	20			5
	50	90				

ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp. / Pugettia sp. / Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp. scabra digitalis 's	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	Littorina planaxis 's			COMMENTS
● m²		×	×	●	×	×××	×			●					●			m²
1 10				(1)		‖				3/52								1
2 10						‖				4/26								2
3 2						‖				5/37								3
4 5				(1)		‖				6/32								4
5 5						‖				12/141					(1)			5
6 5						‖				7/95								6
7 10						‖				12/80								7
8 15						‖				6/113								8
9 10						‖				8/134								9
10 10						‖				5/191								10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW-76 CUZ

YEAR 1978
DATE 8-6
TIDE 0.2
TIME 7:40 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-9/16

AT-9
16

		Balanus- Chthamalus BARNACLES					Littorina scutulata			
m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1	200	18				21			
	2	150	10				17			
	3	30	4				10			
	4	90	15				14			
	5	100					12			
2	6	20	5				9			
	7	300	14				5			
	8	120	40	15			24			
	9	25					31			
	10	50					11			
3	11	180	20	2			17			
	12	125	15				25			
	13	450	35				18			
	14	80		1			35			
	15	320					22			
4	16	50					5			
	17	200	50				19			
	18	10					6			
	19	120					14			
	20	75	9				2			
5	21	400	25				20			
	22	25					7			
	23						15			
	24	350	30				26			
	25	280	12				13			
6	26	60					8			
	27									
	28									
	29	110	7				21			
	30	275	24	5			17			
7	31	120	8				15			
	32	140	5				23			
	33	15								
	34						9			
	35	500	15				14			
8	36	75	10				25			
	37	250	18				12			
	38									
	39	260	6	2			32			
	40	90	15				40			
9	41	45					13			
	42	180	30				4			
	43	30								
	44	125	8				26			
	45	250	120				38			
10	46	280	11				17			
	47	100	24				2			
	48	300	50				29			
	49	250	14				34			
	50	120	10				18			

	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	Littorina planaxis		COMMENTS
m²		●	×	●	●	× × ×	●			●	●				×		m²
1 5		12		2		‖				3 / 71	1						1
2 5		1				‖				2 / 38							2
3 2						‖				4 / 69	4						3
4 5		3		2		‖				2 / 123	1						4
5 2		2		1		‖	1			1 / 115							5
6 2		10		2	1	‖				2 / 94	3						6
7 1		2				‖				3 / 87	7						7
8 2		11		1		‖				5 / 121							8
9 2		30				‖				5 / 109	2						9
10 2		13				‖				8 / 92							10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW-76 CVZ

1-8
1-9

8/6/78

```
          0•     ^
         71•     •  – digi
          3•     A  – addn
         38•     •
          2•     A
         69•     •
          4•     A
        123•     •
          2•     A
        115•     •
          1•     A
         94•     •
          2•     A
         87•     •
          3•     A
        121•     •
          5•     A
        109•     •
          5•     A
         92•     •
          8•     A
         52•     •
          3•     A
         26•     •
          4•     A
         37•     •
          5•     A
         32•     •
          6•     A
        141•     •
         12•     A
         95•     •
          7•     A
         80•     •
         12•     A
        113•     •
          6•     A
        134•     •
          8•     A
        191•     •
          5•     A
         20•     •
     2•0930      •
-    1•••••      •
  1820•0000      •
199276•0000      •
    42•0876      •
    91•0000      •
    71•3026      A
   110•6973      A
-    2•••••      •
   103•0000      •
   709•0000      •
     3•0655      •
     5•1500      •
     3•7153      A
     6•5846      A
     3•••••      •
  1923•0000      •
219825•0000      •
    42•8759      •
    96•1500      •
    76•0836      A
   116•2163      A
•••••••••••      •
     2•0930      •
     0•9464      A
     0•0535      •
     0•9356      A
     0•9571      A
     0•0428      •
     0•0643      •
```

YEAR 1978

DATE 8-6

TIDE 0.2

TIME 7:40 AM

WATER TEMP. ________

SALINITY ________

OTHER :

STUDY SITE ________

TRANSECT AT-10
16

AT-10
16

Balanus-
Chthamalus

● BARNACLES

Littorina scutulata

ALGAE %
A. xanthogrammica
A. elegantissima
Pollicipes sp.
Pachygrapsus sp.
Hemigrapsus sp.
Cancer sp.
Pugettia sp.
Pagurus spp.
Mopalia sp.
Mytilus sp.
Platyodon sp.
Collisella spp.
Tegula sp.
Acanthina sp.
Pisaster sp.
Strongylocentrotus sp.
Littorina planaxis

m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1						24			
	2	200	8				11			
	3	120	20				35			
	4	75	6				18			
	5						15			
2	6	12	5				20			
	7	180					28			
	8	200	12	3			37			
	9	100	30				31			
	10	60					18			
3	11	~~45~~	2				5			
	12	125	7				46			
	13	80	10				29			
	14	100	6				17			
	15	140					33			
4	16	110	15				35			
	17						12			
	18	30	2				20			
	19	45	5	1			15			
	20						42			
5	21	25	8				7			
	22	80					28			
	23	60	4				16			
	24									
	25	150					51			
6	26	10								
	27	18					13			
	28						5			
	29									
	30						18			
7	31	5					12			
	32									
	33						22			
	34	2					17			
	35									
8	36						14			
	37						39			
	38						7			
	39		4	2						
	40						10			
9	41	30					25			
	42	100	15				31			
	43	125					56			
	44	90	6				15			
	45	40					37			
10	46									
	47	175	20				15			
	48	300	8				29			
	49	25					64			
	50	150					15			

● m²		X	●	●	X	XXX	X			●	●				X			COMMENTS	m²
1 5						||				12/136									1
2 5						||				8/129	4								2
3 2						||				3/54									3
4 2				1		||				7/42	1								4
5 1			140			||				9/108									5
6 10						||				7/155									6
7 5						||				5/79									7
8 2						||				3/82									8
9 1			174			||				11/145									9
10 1			5	2		||				9/168									10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW-76 CWZ

```
          1•10        Φ  6
       1978•          Φ  6
-         8•6         Φ  6
          0•0000      Λ
        136•0000      •
         12•0000      A
        129•0000      •
          8•0000      A
         54•0000      •
          3•0000      A
         42•0000      •
          7•0000      A
        108•0000      •
          9•0000      A
        155•0000      •
          7•0000      A
         79•0000      •
          5•0000      A
         82•0000      •
          3•0000      A
        145•0000      •
         11•0000      A
        168•0000      •
          9•0000      A
         10•0000      •
          2•2620      •
-         1••••       •
       1098•0000      •
     137720•0000      •
         43•6648      •   digi
        109•8000      •
         78•5661      A
        141•0338      A
-         2••••       •
         74•0000      •
        632•0000      •   ocab
          3•0623      •
          7•4000      •
          5•2095      A
          9•5904      A
-         3••••       •
       1172•0000      •
     156202•0000      •
         45•7573      •
        117•2000      •
         84•4694      A
        149•9305      A
•••••••••••           •
          2•2620      •
          0•9368      A
          0•0631      •
          0•9207      A
          0•9529      A
          0•0470      •
          0•0792      •
```

YEAR 1978

DATE 11-11

TIDE 0.3

TIME 3:12 PM

WATER TEMP. ______

SALINITY ______

OTHER :

STUDY SITE ______

TRANSECT AT-2 17

AT-2 17

		Balanus-Chthamalus ● BARNACLES					Littorina sp.			
m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1	50	2				8			
	2	5					2			
	3	60					25			
	4	75					6			
	5	30					24			
2	6									
	7	14	2				5			
	8						1			
	9	25					3			
	10	5	2				2			
3	11	20					3			
	12	22	10				4			
	13						8			
	14	12	3				3			
	15	18					2			
4	16									
	17						9			
	18	11	1				15			
	19									
	20	13	5				4			
5	21	12	8				5			
	22						3			
	23	75	14				3			
	24						2			
	25	50	6							
6	26									
	27									
	28	24	5				1			
	29	8								
	30									
7	31						2			
	32	2					1			
	33	90	20				2			
	34	24	1				2			
	35	130	4				1			
8	36	35	2				1			
	37						4			
	38	7								
	39	1					1			
	40									
9	41	4								
	42	20	4				3			
	43	80	13				7			
	44	65	11				10			
	45	12	15				1			
10	46	2								
	47	30	7				1			
	48	6					1			
	49									
	50						8			

	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.			COMMENTS
m²		●		××	××●	×			●	●	●						m²
1 2					3					21	1						1
2 3					2					22	2						2
3 1		2			3					57	3						3
4 1		3			3				1	79	1						4
5		1			3				3	65	3						5
6 2		3			2					89	1						6
7 2		2			1					48							7
8 2		9			3					80	2						8
9 1		5			3				1	67	1						9
10 5		3			4					76							10

SIZE AVERAGE : 2-3 mm % YOUNG :

P = PRESENCE

TW-76 CUZ

```
        1•2          Φ 6
     1978•           Φ 6
-      11•11         Φ 6
        0•0000       ∧
            8•       •
            2•       •
           25•       •
            6•       •
           24•       •
            5•       •
            1•       •
            3•       •
            2•       •
            3•       •
            4•       •
            8•       •
            3•       •
            2•       •
            9•       •
           15•       •
            4•       •
            5•       •
            3•       •
            3•       •
            2•       •
            1•       •
            2•       •
            1•       •
            2•       •
            2•       •
            1•       •
            1•       •
            4•       •
            1•       •
            3•       •
            7•       •
           10•       •
            1•       •
            1•       •
            1•       •
            8•       •
           37•       t11 /
           13•       Σ11 /
           50•       A
        1•9600       •
-       1••••        •
      183•0000       •
     2073•0000       •
        5•3513       •   LT
        3•6600       •
        2•1766       A
        5•1433       A

        0•0000       ∧
        1•0000       •
        3•0000       •
        1•0000       •
        7•0000       Σ11 /
       10•0000       A
        2•2620       •
-       1••••        •
        5•0000       •   Col
       11•0000       •
        0•9718       •
        0•5000       •
-       0•1951       A
        1•1951       A
```

YEAR 1978
DATE 11-13
TIDE - 0.5
TIME 4:42 PM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE 1978
TRANSECT AT-3
17

AT-3
17

Balanus-Chthamalus

m²	dm²	BARNACLES LIVE	DEAD	SCAR	mm SIZE	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
						● m²		●		×	×	×	●	●	●		●	●	●	●	×			
1	1 2 3 4 5					1 55								7			1		54	9				1
2	6 7 8 9 10					2 65								5			2		23	3				2
3	11 12 13 14 15					3 85								5			5		29					3
4	16 17 18 19 20					4 60								4			2		34					4
5	21 22 23 24 25					5 75								3			2		50					5
6	26 27 28 29 30					6 75								2			3		39					6
7	31 32 33 34 35					7 75								1			2	1	40	2				7
8	36 37 38 39 40					8 70								2			4		43					8
9	41 42 43 44 45					9 60								3	1		5		24					9
10	46 47 48 49 50					10 65		1					1	4	1		4		23	2				10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE

TW - 76 CUL

YEAR 1978
DATE 11-13
TIDE -0.5
TIME 4:42 PM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-7 / 17

AT-7 / 17

m²	dm²	Balanus-Chthamalus BARNACLES LIVE	DEAD	SCAR	mm SIZE		Littorina sp. ●			
1	1									
	2						1			
	3						5			
	4						7			
	5						3			
2	6						9			
	7						2			
	8						1			
	9									
	10						4			
3	11						5			
	12									
	13									
	14						1			
	15						1			
4	16									
	17									
	18									
	19									
	20						1			
5	21									
	22									
	23						4			
	24						2			
	25						1			
6	26						3			
	27									
	28						3			
	29						6			
	30						5			
7	31									
	32						4			
	33						9			
	34									
	35									
8	36						1			
	37						3			
	38						5			
	39						12			
	40									
9	41						5			
	42						2			
	43						3			
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima ●	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp. ××	Cancer sp. Pugettia sp. Pagurus spp. ××●	Mopalia sp. ×	Mytilus sp.	Platyodon sp.	Collisella spp. ●	Tegula sp. ●	Acanthiha sp. ●	Pisaster sp.	Strongylocentrotus sp.			COMMENTS	m²
1		28			||				2	8							1
2		81			|| 1				2	16							2
3		90			|| 2				5	39							3
4		64			|| 5				2	75							4
5		116			|| 2					37	(1)						5
6		123			||					21							6
7		145			|| 3					35	(3)						7
8		99			|| 7				1	52							8
9		61			||				4	24							9
10					||												10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW-76 CUZ

```
          1•7          Φ  6
       1978•           Φ  6
-        11•13         Φ  6
          0•0000       Λ
          1•0000       •
          5•0000       •
          7•0000       •
          3•0000       •
          9•0000       •
          2•0000       •
          1•0000       •
          4•0000       •
          5•0000       •
          1•0000       •
          1•0000       •
          1•0000       •
          4•0000       •
          2•0000       •
          1•0000       •
          3•0000       •
          3•0000       •
          6•0000       •
          5•0000       •
          4•0000       •
          9•0000       •
          1•0000       •
          3•0000       •
          5•0000       •
         12•0000       •
          5•0000       •
          2•0000       •
          3•0000       •
         17•0000       Σ11 /
         45•0000       A
          1•9600       •
-         1••••        •
        108•0000       •
        628•0000       •
          2•8951       •
          2•4000       •
          1•5541       A
          3•2458       A
```

UT

EAR 1978
DATE 11-10
TIDE 0.9
TIME 2:10 PM

WATER TEMP. ______
SALINITY ______
OTHER : ● Pachygrapsus BERM COUNT ☐

STUDY SITE ______
TRANSECT AT-8
17

AT-8
17

m²	dm²	Balanus-Chthamalus ● BARNACLES LIVE	DEAD	SCAR	mm SIZE		Littorina scutulata ●			
1	1						3			
	2	1					5			
	3	4					9			
	4						13			
	5						9			
2	6						2			
	7						16			
	8	30		1			15			
	9						12			
	10	10					21			
3	11						16			
	12	5					15			
	13	15	1				9			
	14						8			
	15	3					15			
4	16						12			
	17	8					27			
	18						11			
	19	6					1			
	20	4					6			
5	21	2					32			
	22						15			
	23						8			
	24						12			
	25						27			
6	26						6			
	27	7					11			
	28	60					18			
	29	14					5			
	30						16			
7	31	45	1							
	32	75					14			
	33	13					23			
	34	80	5							
	35	130					1			
8	36	400	75				7			
	37	250	10	1			8			
	38						13			
	39	200	12				17			
	40	350	8				5			
9	41	180	4				19			
	42	30	2				12			
	43	140	5				15			
	44	50					32			
	45	50	15				26			
10	46						7			
	47	60	8				34			
	48	25					13			
	49						14			
	50	75					25			

● m²	ALGAE %	● A. xanthogrammica	× A. elegantissima	● Pollicipes sp.	× Pachygrapsus sp. Hemigrapsus sp.	× Cancer sp.	× Pugettia sp.	× Pagurus spp.	× Mopalia spp.	Mytilus sp.	Platyodon sp.	● Collisella spp.	× Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	● Littorina planaxi			COMMENTS	m²
1 10				3								4/7									1
2 10												1/0									2
3 10												1/6									3
4 15												3/1					1				4
5 5												2/31									5
6												1/38									6
7 1												4/41									7
8 10		8										4/37									8
9 15												6/53									9
10 15		2										6/32					1				10

SIZE AVERAGE : 2-3 mm   % YOUNG :

P = PRESENCE

TW - 76 CUR.

YEAR 1978
DATE 11-10
TIDE 0.9
TIME 2:10 pm

WATER TEMP. ________
SALINITY ________
OTHER :

STUDY SITE ________
TRANSECT AT-9
17

AT-9
17

● BARNACLES
Balanus-Chthamalus
Littorina scutulata
ALGAE %
A. xanthogrammica
A. elegantissima
Pollicipes sp.
Pachygrapsus sp.
Hemigrapsus sp.
Cancer sp.
Pugettia sp.
Pagurus spp.
Mopalia sp.
Mytilus sp.
Platyodon sp.
Collisella spp.
Tegula sp.
Acanthina sp.
Pisaster sp.
Strongylocentrotus sp.
Littorina planaxis
COMMENTS

m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1	9					16			
	2						33			
	3						8			
	4						7			
	5	6					3			
2	6	30	4				23			
	7	45	6				7			
	8	60	4				17			
	9						13			
	10	14	2				10			
3	11						18			
	12	12					14			
	13	200					6			
	14	28					5			
	15	10					11			
4	16	50					9			
	17	40	6				1			
	18	30					4			
	19	120					5			
	20	75	8				2			
5	21						11			
	22									
	23									
	24	150	6				2			
	25	1					7			
6	26	12	2				18			
	27	40					1			
	28									
	29	100					20			
	30	120	10				1			
7	31	60					24			
	32	200	14				3			
	33									
	34	150					4			
	35	90	4	1			10			
8	36	20					9			
	37	500					4			
	38	300					1			
	39	100					19			
	40	200					5			
9	41	30					10			
	42	125	2				11			
	43	14	4				2			
	44	16	5				12			
	45	100					20			
10	46	12	2				16			
	47	60	12				13			
	48	250					20			
	49	180					13			
	50	80	10				7			

● m²		●	X	●	●	XX●	X			●	●				●			m²
1 10		13		1						5/40								1
2 15		2		3						2/12								2
3 5										4/30								3
4 15		3		1	5					8/62								4
5 30					3	1				10/47	2							5
6 25		3		1	2					6/43	1							6
7 20		16		1	2	2				5/56	14							7
8 35		1				1				2/35	7							8
9 45		34				2				3/53	10							9
10 50		8		1		2				7/64	10				1			10

SIZE AVERAGE : 2-3 mm
% YOUNG :
P = PRESENCE
TW-76 cvr

BEIRM-1/8,9,10 LIT

```
       1•8       Φ  6
       1•9       Φ  6
    1978•        Φ  6
-     11•10      Φ  6
       0•00      ^
         3•      •
         5•      •
         9•      •
        13•      •
         9•      •
         2•      •
        16•      •
        15•      •
        12•      •
        21•      •
        16•      •
        15•      •
         9•      •
         8•      •
        15•      •
        12•      •
        27•      •
        11•      •
         1•      •
         6•      •
        32•      •
        15•      •
         8•      •
        12•      •
        27•      •
         8•      •
        11•      •
        18•      •
         5•      •
        16•      •
        14•      •
        23•      •
         1•      •
         7•      •
         8•      •
        13•      •
        17•      •
         5•      •
        19•      •
        12•      •
        15•      •
        32•      •
        26•      •
         7•      •
        34•      •
        13•      •
        14•      •
        25•      •
        16•      •
```

```
          33•     •
           8•     •
           7•     •
           3•     •
          23•     •
           7•     •
          17•     •
          13•     •
          10•     •
          18•     •
          14•     •
           6•     •
           5•     •
          11•     •
           9•     •
           1•     •
           4•     •
           5•     •
           2•     •
          11•     •
           2•     •
           7•     •
          18•     •
           1•     •
          20•     •
           1•     •
          24•     •
           3•     •
           4•     •
          10•     •
           9•     •
           4•     •
           1•     •
          19•     •
           5•     •
          10•     •
          11•     •
           2•     •
          12•     •
          20•     •
          16•     •
          13•     •
          20•     •
          13•     •
           7•     •
          94•     ↑11  /
           6•     Σ11  /
         100•     A
      1•9600      •
-     1•••••      •
   1137•0000      •
  19569•0000      •
      8•1904      •
     11•3700      •
      9•7646      A
     12•9753      A
```

```
       1•8000
       0•0000    Λ
       1•8       Φ  6
       1•9       Φ  6
    1978•        Φ  6
-     11•10      Φ  6
       0•0000    Λ
          1•     •
          0•     A
          4•     •
          0•     A
         30•     •
          0•     A
         10•     •
          0•     A
          5•     •
          0•     A
         15•     •
          1•     A
          3•     •
          0•     A
          8•     •
          0•     A
          6•     •
          0•     A
          4•     •
          0•     A
          2•     •
          0•     A
          7•     •
          0•     A
         60•     •
          0•     A
         14•     •
          0•     A
         45•     •
          1•     A
         75•     •
          0•     A
         13•     •
          0•     A
         80•     •
          5•     A
        130•     •
          0•     A
        400•     •
         75•     A
        250•     •
         10•     A
        200•     •
         12•     A
        350•     •
          8•     A
        180•     •
          4•     A
         30•     •
          2•     A
        140•     •
          5•     A
         50•     •
          0•     A
```

```
 50•     •
 15•     A
 60•     •
  8•     A
 25•     •
  0•     A
 75•     •
  0•     A
  9•     •
  0•     A
  6•     •
  0•     A
 30•     •
  4•     A
 45•     •
  6•     A
 60•     •
  4•     A
 14•     •
  2•     A
 12•     •
  0•     A
200•     •
  0•     A
 28•     •
  0•     A
 10•     •
  0•     A
 50•     •
  0•     A
 40•     •
  6•     A
 30•     •
  0•     A
120•     •
  0•     A
 75•     •
  8•     A
150•     •
  6•     A
  1•     •
  0•     A
 12•     •
  2•     A
 40•     •
  0•     A
100•     •
  0•     A
120•     •
 10•     A
 60•     •
  0•     A
200•     •
 14•     A
150•     •
  0•     A
 90•     •
  4•     A
 20•     •
  0•     A
```

```
         0•    A
       300•    •
         0•    A
       100•    •
         0•    A
       200•    •
         0•    A
        30•    •
         0•    A
       125•    •
         2•    A
        14•    •
         4•    A
        16•    •
         5•    A
       100•    •
         0•    A
        12•    •
         2•    A
        60•    •
        12•    A
       250•    •
         0•    A
       180•    •
         0•    A
        80•    •
        10•    A
        71•    I   /
        29•    Σ   /
       100•    •
    1•9600     •
-   1•••••     •
 5961•0000     •
1207267•000    •
   92•7651     •
   59•6100     •   BAL
   41•4280     A
   77•7919     A   L
-   2•••••     •
  247•0000     •
 7111•0000     •
    8•1034     •   D
    2•4700     •
    0•8817     A
    4•0582     A
-   3•••••     •
 6208•0000     •
1313542•000    •
   96•8258     •
   62•0800     •
   43•1021     A
   81•0578     A
•••••••••••    •
    1•9600     •
    0•9602     A
```

```
      0•0397  •
      0•9553  A
      0•9650  A
      0•0349  •
      0•0446  •


      0•0000  ^
      0•0000  •
      3•0000  A
      8•0000  •
      0•0000  A
      2•0000  •
      0•0000  A
     13•0000  •
      1•0000  A
      2•0000  •
      3•0000  A
      3•0000  •
      1•0000  A
      3•0000  •
      1•0000  A
     16•0000  •
      1•0000  A
      1•0000  •
      0•0000  A
     34•0000  •
      0•0000  A
      8•0000  •
      1•0000  A
     11•0000  •
      9•0000  Σ  /
      2•2620  •
-     1••••   •
      0•0000  •
   1736•0000  •
      8•3697  •
      4•5000  •
      0•2665  A
      8•7334  A
-     2••••   •
     11•0000  •
     23•0000  •
      0•9445  •
      0•5500  •
      0•0722  A
      1•0277  A
-     3••••   •
    101•0000  •
   1857•0000  •
      8•4197  •
      5•0500  •
      0•7913  A
      9•3086  A
 ••••••••••   •
```

```
      0•0000     ∧
     20•0000     ħ  1
     90•0000     ħ  2
   1736•0000     ħ  3
     11•0000     ħ  4
     23•0000     ħ  5
    101•0000     ħ  7
   1857•0000     ħ  0
     20•0000     •
      2•0930     •
-     1•••••     •
     90•0000     •
   1736•0000     •
      8•3697     •
      4•5000     •
      0•5828     A
      8•4171     A
-     2•••••     •
     11•0000     •
     23•0000     •
      0•9445     •
      0•5500     •
      0•1079     A
      0•9920     A
-     3•••••     •
    101•0000     •
   1857•0000     •
      8•4197     •
      5•0500     •
      1•1094     A
      8•9905     A
 ••••••••••••    •
      2•0930     •
      0•8910     A
      0•1089     •
      0•8262     A
      0•9559     A
      0•0440     •
      0•1737     •

      ~~1•10~~   Φ  6

      1•8        Φ  6
      1•9        Φ  6
      0•0000     ∧
      4•0000     •
      7•0000     A
      1•0000     •
      0•0000     A
      1•0000     •
      6•0000     A
      3•0000     •
      1•0000     A
      2•0000     •
     31•0000     A
      1•0000     •
     38•0000     A
      4•0000     •
     41•0000     A
```

```
        4•0000      •
       37•0000      A
        6•0000      •
       53•0000      A
        6•0000      •
       32•0000      A
        5•0000      •
       40•0000      A
        2•0000      •
       12•0000      A
        4•0000      •
       30•0000      A
        8•0000      •
       62•0000      A
       10•0000      •
       47•0000      A
        6•0000      •
       43•0000      A
        5•0000      •
       56•0000      A
        2•0000      •
       35•0000      A
        3•0000      •
       53•0000      A
        7•0000      •
       64•0000      A
       20•0000      •
        2•0930      •
 -      1•••••      •
       84•0000      •   scal
      468•0000      •
        2•4623      •
        4•2000      •
        3•0475      A
        5•3524      A
 -      2•••••      •
      688•0000      •   digi
    31186•0000      •
       19•8928      •
       34•4000      •
       25•0899      A
       43•7100      A
 -      3•••••      •
      772•0000      •
    38622•0000      •
       21•5489      •
       38•6000      •
       28•5148      A
       48•6851      A
  ••••••••••••      •
        2•0930      •
        0•1088      A
        0•8911      •
        0•0853      A
        0•1322      A
    38622•0000      •
    38622•0469      •
        0•8677      •
        0•9146      •
```

YEAR 1978
DATE 11-10
TIDE 0.9
TIME 2:10 pm

WATER TEMP. ________
SALINITY ________
OTHER :

STUDY SITE ________
TRANSECT AT-10 17

AT-10 17

Balanus-Chthamalus
Littorina scutulata

● BARNACLES

m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1	10					10			
	2	450	15				8			
	3	80	7				12			
	4						1			
	5						9			
2	6	30	2				35			
	7	120	15				18			
	8	275	20				38			
	9	60	4	1			2			
	10	15	10				27			
3	11	8					12			
	12	75	9				20			
	13	110	3				6			
	14	130	5				13			
	15	175	4				11			
4	16	60					14			
	17	15								
	18						28			
	19	7					23			
	20	30					52			
5	21									
	22	160	5				4			
	23	35					1			
	24	12					17			
	25	120	14				10			
6	26	3								
	27	2					5			
	28									
	29									
	30						14			
7	31									
	32									
	33									
	34									
	35									
8	36						2			
	37	4					1			
	38						11			
	39						3			
	40	24					2			
9	41	24	2				12			
	42	15								
	43	160					4			
	44	15					2			
	45	50					33			
10	46	6					8			
	47	30	2							
	48	350	8				10			
	49	45					3			
	50	120	3				1			

ALGAE %
A. xanthogrammica
A. elegantissima
Pollicipes sp.
Pachygrapsus sp.
Hemigrapsus sp.
Cancer sp.
Pugettia sp.
Pagurus spp.
Mopalia sp.
Mytilus sp.
Platyodon sp.
Collisella spp.
Tegula sp.
Acanthina sp.
Pisaster sp.
Strongylocentrotus sp.
Littorina planaxis

m²		●	●	●	X	XXX	X			●	●				X			COMMENTS	m²
1 10										10/85									1
2 5		2								15/149									2
3 2										/47									3
4 1										1/21									4
5 5			123							/94	22								5
6 50										7/49									6
7 2										/									7
8										1/63									8
9 2			168							16/130									9
10 1			8	2						5/136									10

SIZE AVERAGE : 3 mm
% YOUNG :
P = PRESENCE
TW - 76 CUZ

```
     0•0433       •
     0•9493       A

     1•10         Φ  6
  1978•           Φ  6
-   11•10         Φ  6
     0•0000       Λ
         10•      •
          0•      A
        450•      •
         15•      A
         80•      •
          7•      A
         30•      •
          2•      A
        120•      •
         15•      A
        275•      •
         20•      A
         60•      •
          4•      A
         15•      •
         10•      A
          8•      •
          0•      A
         75•      •
          9•      A
        110•      •
          3•      A
        130•      •
          5•      A
        175•      •
          4•      A
         60•      •
          0•      A
         15•      •
          0•      A
          7•      •
          0•      A
         30•      •
          0•      A
        160•      •
          5•      A
         35•      •
          0•      A
         12•      •
          0•      A
        120•      •
         14•      A
          3•      •
          0•      A
```

```
            2•        •
            0•        A
            4•        •
            0•        A
           24•        •
            0•        A
           24•        •
            2•        A
           15•        •
            0•        A
          160•        •
            0•        A
           15•        •
            0•        A
           50•        •
            0•        A
            6•        •
            0•        A
           30•        •
            2•        A
          350•        •
            8•        A
           45•        •
            0•        A
          120•        •
            3•        A
           35•        I11  /
           15•        Σ11  /
           50•        •
        1•9600        •
-       1••••         •
     2825•0000        • BAL
   584799•0000        •
       93•1518        •
       56•5000        •
       30•6796        A ✓
       82•3203        A
-       2••••         •
      128•0000        •
     1452•0000        •
        4•7901        •
        2•5600        •
        1•2322        A
        3•8877        A
-       3••••         •
     2953•0000        •
   632577•0000        •
       96•6978        •
       59•0600        •
       32•2567        A
       85•8632        A
  ••••••••••••        •
        1•9600        •
        0•9566        A
```

```
         0•0433     •
         0•9493     A
         0•9639     A
    632577•0000     •
    632577•0146     •
    632577•0000     •
    632577•0146     •
         0•0360     •
         0•0506     •


         0•0000     ^
       123•0000     •
         0•0000     A
       168•0000     •
         0•0000     A
         8•0000     •
         2•0000     A
         3•0000     I()   /
         7•0000     Σ()   /
        10•0000     •
         2•2620     •
-        1•••••     •
       299•0000     •
     43417•0000     •
        61•8931     •
        29•9000     •
-       14•3726     A
        74•1726     A
-        2•••••     •
         2•0000     •
         4•0000     •
         0•6324     •
         0•2000     •
-        0•2523     A
         0•6523     A
-        3•••••     •
       301•0000     •
     43453•0000     •
        61•8177     •
        30•1000     •
-       14•1186     A
        74•3186     A
  •••••••••••••     •


         0•0000     ^
        10•0000     •
        85•0000     A
        15•0000     •
       149•0000     A
         0•0000     •
```

for

Pooly

```
        47•0000        A
         1•0000        •
        21•0000        A
         0•0000        •
        94•0000        A
         7•0000        •
        49•0000        A
         0•0000        •
         0•0000        A
         1•0000        •
        63•0000        A
        16•0000        •
       130•0000        A
         5•0000        •
       136•0000        A
        10•0000        •
         2•2620        •
-        1•••••        •
        55•0000        •
       657•0000        •
         6•2760        •
         5•5000        •
         1•0106        A
         9•9893        A
-        2•••••        •
       774•0000        •
     82678•0000        •
        50•2995        •
        77•4000        •
        41•4203        A
       113•3796        A
-        3•••••        •
       829•0000        •
     95879•0000        •
        54•9291        •
        82•9000        •
        43•6087        A
       122•1912        A
  ••••••••••••         •
         2•2620        •
         0•0663        A
         0•9336        •
         0•0467        A
         0•0858        A
         0•9141        •
         0•9532        •


  ••••••••••••         •
         1•9600        •
         0•9566        A
```

ocal

dági

1.7 STAT ANALYSIS as of 1977

DUXBURY REEF
DX-AT-7 = 9m^2

m^2

① x = Anthopleura elegantissima
y = all crabs
② x = Tegula funebralis
y = no ACA AEL, all crabs, Collisella spp, Mopalia sp
③ note Total only = Acanthina spirata
④ dm^2, x only of Littorina scutulata

(AEL crabs
COL MOP
TEG + other (no ACA)) = ALL

AEL crabs ΣACA

dm^2
LIT

1.7 COUNT and STAT ANALYSIS
COUNTING INSTRUCTIONS - 1975

DUXBURY REEF
DX-AT-7, 9m^2

m^2

② Tegula funebralis
① Anthopleura elegantissima
Pachygrapsus, Hemigrapsus
Cancer, Pugettia, Pagurus
② Mopalia
Collisella
~~Acanthina~~

① Littorina scutulata

Σ only = Acanthina

STAT CARD TEG + AEL COL MOP crabs = ALL (no LIT)

LITT

↓

AEL

other ΣACA

YEAR 1978
DATE 11-11
TIDE 0.3
TIME 3:12 pm

WATER TEMP.
SALINITY
OTHER :

STUDY SITE
TRANSECT BT-2 17

BT-2 17

P

		Balanus-Chthamalus BARNACLES					Littorina sp				ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.					COMMENTS	
m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●				● m²		●		×	×	×	●	●	×			●	●	●								m²
1	1										1 50												31	54									1
	2						2																										
	3																																
	4						1																										
	5																																
2	6										2 30							1					45	41									2
	7																																
	8						1																										
	9						1																										
	10																																
3	11										3 30												78	67									3
	12																																
	13																																
	14																																
	15																																
4	16						3				4 25												55	29	1								4
	17																																
	18																																
	19						2																										
	20																																
5	21						1				5 15												62	43									5
	22						1																										
	23																																
	24						1																										
	25																																
6	26										6 30		4										39	18									6
	27																																
	28						4																										
	29																																
	30																																
7	31						2				7 40		25						1				57	50	3								7
	32																																
	33																																
	34						3																										
	35																																
8	36						1				8 50		8										40	63	1								8
	37																																
	38						5																										
	39																																
	40						1																										
9	41										9 60												53	45									9
	42																																
	43						3																										
	44																																
	45						3																										
10	46										10 60												36	28									10
	47						1																										
	48																																
	49						4																										
	50																																

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW-76 CUL

YEAR 1978
DATE 11-27
TIDE -0.0
TIME 3:32 pm

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT BT-3
17

BT-3
17

BARNACLES – Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	m²
●			●		●	×	×	×	●			●	×	●	●							
1	95								1			2		8								1
2	95								1			5		10	1							2
3	95											10		12								3
4	60											2		5								4
5	60				1				10			6		20	1							5
6	90								2			1		31								6
7	95								1			5		30								7
8	95								1			2		14								8
9	90								2			2		28								9
10	85		1						2			8		12								10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUZ

YEAR 1978
DATE 11-27
TIDE -0.0
TIME 3:32 pm

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT BT-4 17

BT-4 17

Balanus-Chthamalus

m²	dm²	BARNACLES LIVE	DEAD	SCAR	mm SIZE					● m²	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
												●		XX	XX●	●	●		●	●	●	X						
1	1 2 3 4 5									1 50		2			|| 1	12			86	2								1
2	6 7 8 9 10									2 50		8			|| 1	4			148									2
3	11 12 13 14 15									3 60		6			||	8			70									3
4	16 17 18 19 20									4 50		56			|| 1	7			84									4
5	21 22 23 24 25									5 50		6			||	6			47									5
6	26 27 28 29 30									6 50		23			||	4	1		53	12								6
7	31 32 33 34 35									7 55		25			||	3			69	14								7
8	36 37 38 39 40									8 60		52			|| 2	7			62	31	1							8
9	41 42 43 44 45									9 55		34			|| 1	3			85	30								9
10	46 47 48 49 50									10 50		56			||	6			59	16								10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW-76 CUL

YEAR 1978
DATE 11-12
TIDE -0.2
TIME 3:57pm

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-1
17

CT-1
17

BARNACLES
Balanus-Chthamalus

ALGAE %, A. xanthogrammica, A. elegantissima, Pollicipes sp., Pachygrapsus sp., Hemigrapsus sp., Cancer sp., Pugettia sp., Pagurus spp., Mopalia sp., Mytilus sp., Platyodon sp., Collisella spp., Tegula sp., Acanthina sp., Pisaster sp., Strongylocentrotus sp.

m²	dm²	LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

● m²		●		××	××●	●			●	●	●						COMMENTS	m²
1 80		12			8	2			30	23	4							1
2 75		15			11	2			14	35	2							2
3 50		4			16				5	17								3
4 20					5					21								4
5 40					7	1				30	2							5
6 75		3			3				1	14								6
7 75					5					6	1							7
8 80					2					11	3							8
9 80					8	1				5								9
10 75		2			15	1			1	9	2							10

SIZE AVERAGE :　　% YOUNG :　　P = PRESENCE　　TW-76 CUR.

YEAR 1978
DATE 11-12
TIDE -0.2
TIME 3:57 PM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-2 17

CT-2 17

Balanus- Chthamalus

BARNACLES

m²	dm²	LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	m²
	●						●		●	●	●							
1							283		192	21								1
2	10						12		39	15								2
3	12								11	43	1							3
4	23									25								4
5	8								2	18	1							5
6	4									20								6
7	5									7								7
8	1									5								8
9	1																	9
10										2								10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW-76 CUR

YEAR 1978
DATE 11-28
TIDE -0.5
TIME 4:12 pm

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-4
17

CT-4
17

BARNACLES
Balanus-Chthamalus
Mytilus sp.
Tegula sp.
Thais
Littorina sp.
ALGAE %
A. xanthogrammica
A. elegantissima
Pollicipes sp.
Pachygrapsus sp.
Hemigrapsus sp.
Cancer sp.
Pugettia sp.
Pagurus spp.
Mopalia sp.
Mytilus sp.
Platyodon sp.
Collisella spp.
Tegula sp.
Acanthina sp.
Pisaster sp.
Strongylocentrotus sp.
COMMENTS

m²	dm²	LIVE	DEAD	SCAR	mm SIZE	●		●	●	●	m²			●	● ×	× × ×		DEAD ●		●								COMMENTS	m²
1	1	250	15			12		2	1		1 25			17				5		23									1
	2	500	24	3		12																							
	3	150	5			11		1	2	5																			
	4	400	20			10		4																					
	5	400	75			13		2	1																				
2	6	75	14	5		15					2 30			7				7		18									2
	7	120	3			10		3		12																			
	8	300	10			9		1																					
	9	250	7			12		1																					
	10	100				14		5																					
3	11	250	12			14		1			3 30			3				10		27									3
	12	150	10			11		4	1																				
	13	400				20		2																					
	14	125	6			15		4																					
	15	150	20			9		3																					
4	16	250	8			14		3	1		4 25			5				10		34									4
	17	300	15			13		1																					
	18	450	15			13		2																					
	19	200	3			16		2	2	1																			
	20	200	24			5		2		3																			
5	21	150	5			20		5			5 40			208				5		40									5
	22	125	9			11			3																				
	23	200	5			5																							
	24	100				6		2																					
	25	150	10			12		1																					
6	26	120	4			15		1			6 30			9	1			6		25									6
	27	180	12			18		2	1	4																			
	28	250				15		1	1																				
	29	80	30			14		1																					
	30	60	18					3																					
7	31	400	17	1		10		2			7 50							9		51									7
	32	200	10			11		3		1																			
	33	75	30	2		9				1																			
	34	300				13		2		2																			
	35	160	5			6		2																					
8	36	50	15			17		3	1	1	8 50			12				7		36									8
	37	125	8			15		1	2	7																			
	38	200	14			15		1																					
	39	150	10			18		6		2																			
	40	250				5		1																					
9	41	300	35			11		1	1		9 40			10				5		17									9
	42	250	20	1		10		1																					
	43	150	50			12		4	1	1																			
	44	400	16			12			1																				
	45	80				10		2																					
10	46	120	5			23		1		3	10 40							4		24									10
	47	200	5			20		1	1																				
	48	100	12			22		3																					
	49	30	4			19		1		2																			
	50	50	10			15		5																					

SIZE AVERAGE : 3 mm
% YOUNG :
P = PRESENCE
TW - 76 CUZ

YEAR 1978
DATE 11-28
TIDE -0.5
TIME 4:12 PM

WATER TEMP.
SALINITY
OTHER :

STUDY SITE 1
TRANSECT CT-5
17

CT-5
17

BARNACLES

m²	dm²	Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.		Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.			COMMENTS	
m²	●			×	×	●	●	●							●						m²
1	6														1						1
2	10						1	3							3						2
3	20					1		5							1						3
4	12														1						4
5	9					1									4						5
6	7					1		2													6
7	12														2						7
8	8							2							1						8
9	11																				9
10	8																				10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUZ

YEAR 1978
DATE 11-12
TIDE -0.2
TIME 3:57 pm

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-7 17

CT-7 17

Balanus-Chthamalus ● BARNACLES

m²	dm²	LIVE	DEAD	SCAR	mm SIZE					
1	1	30	4							
	2	15	20							
	3									
	4	700	120							
	5	350	50	10						
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.		Littorina sp.		COMMENTS	m²
		●		X	X	X	X	●				●	●	●				●			
1		12						5				410	53	2				2,400			1
2																					2
3																					3
4																					4
5																					5
6																					6
7																					7
8																					8
9																					9
10																					10

SIZE AVERAGE : 3 mm   % YOUNG :   P = PRESENCE   TW-76 CWL

YEAR 1978
DATE 11-28
TIDE -0.5
TIME 4:12 PM

WATER TEMP. ________
SALINITY ________
OTHER: ● Saccoglossus sp. P

STUDY SITE ________
TRANSECT CT-12
17

CT-12
17

m²	dm²	BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
1																	1
2																	2
3																	3
4																	4
5																	5
6																	6
7																	7
8																	8
9																	9
10																	10

SIZE AVERAGE:
% YOUNG:
P = PRESENCE
TW-76 CUL

YEAR 1979
DATE 5-29
TIDE -0.6
TIME 8:28 AM

WATER TEMP. ____
SALINITY ____
OTHER :

STUDY SITE ____
TRANSECT AT-3
19

AT-3
19

Balanus-Chthamalus

BARNACLES

m²	dm²	LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10								130	
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20								150	
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30								145	
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40								150	
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50								180	

	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp. Cancer sp. Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.			COMMENTS
● m²		●		× ●	× × ●	●		●	●	●	●						m²
1 70					|| 4	1		4		46							1
2 60		1			|| 3			2	1	35							2
3 80					|| 1			4		17							3
4 70					|| 5			2		39	1						4
5 70					|| 3					41							5
6 75				1	|| 6			2		28	1						6
7 70					|| 7	1		1		50							7
8 80					|| 5					48	1						8
9 90					|| 3			4		42	1						9
10 90					|| 2			5		49							10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUZ

```
      0•0000   Λ
      1•8      Φ  6
      1•9      Φ  6
   1979•       Φ  6
-     5•19     Φ  6
      0•0000   Λ
          1•   •
          0•   A
         10•   •
          0•   A
         35•   •
          7•   A
         60•   •
          0•   A
         50•   •
          2•   A
          1•   •
          0•   A
         12•   •
          2•   A
         35•   •
          9•   A
         10•   •
          0•   A
         20•   •
          1•   A
          4•   •
          0•   A
          5•   •
          3•   A
          4•   •
          2•   A
          1•   •
          0•   A
         15•   •
          0•   A
        125•   •
          6•   A
         80•   •
          5•   A
         12•   •
          9•   A
        140•   •
         20•   A
         15•   •
          3•   A
         80•   •
          3•   A
         20•   •
          1•   A
        200•   •
         60•   A
        180•   •
          9•   A
          5•   •
          0•   A
        120•   •
          4•   A
        250•   •
         20•   A
        150•   •
          8•   A
         40•   •
          3•   A
        140•   •
         12•   A
         25•   •
         10•   A
         60•   •
          9•   A
        110•   •
         25•   A
         15•   •
          4•   A
         30•   •
          2•   A
         18•   •
          0•   A
         20•   •
```

```
             0•      A
            50•      •
             4•      A
            80•      •
             2•      A
            40•      •
            10•      A
           130•      •
            12•      A
           200•      •
            30•      A
            75•      •
             7•      A
            50•      •
             6•      A
            11•      •
             0•      A
            30•      •
             2•      A
           180•      •
            70•      A
           300•      •
            25•      A
            75•      •
            18•      A
            60•      •
            15•      A
           200•      •
            20•      A
            75•      •
             0•      A
            25•      •
            11•      A
            30•      •
             4•      A
             8•      •
             1•      A
           160•      •
            20•      A
            30•      •
            12•      A
           100•      •
            35•      A
             8•      •
             2•      A
            30•      •
             0•      A
            40•      •
             3•      A
           300•      •
            24•      A
            50•      •
             6•      A
           350•      •
            12•      A
            60•      •
             5•      A
           140•      •
            10•      A
           175•      •
            35•      A
            20•      •
             1•      A
           150•      •
            11•      A
            15•      •
             2•      A
            40•      •
            30•      A
            75•      •
            18•      A
            50•      •
             8•      A
            10•      •
             5•      A
            74•      I◇   /
            26•      Σ◇   /
           100•      •
        1•9600       •
-       1•••••       •
     5520•0000       •
   865796•0000       •
```

```
      75•2834      •
      55•2000      •
      40•4444      A
      69•9555      A
-      2•••••      •
     715•0000      •
   19045•0000      •
      11•8631      •
       7•1500      •
       4•8248      A
       9•4751      A
-      3•••••      •
    6235•0000      •
 1081299•000       •
      83•6386      •
      62•3500      •
      45•9568      A
      78•7431      A
•••••••••••        •
       1•9600      •
       0•8853      A
       0•1146      •
       0•8774      A
       0•8932      A
 1081299•000       •
 1081299•015       •
       0•1067      •
       0•1225      •

       0•0000      ^
       6•0000      •
       0•0000      A
       2•0000      •
       1•0000      A
       5•0000      •
       0•0000      A


       0•0000      ^
       6•0000      •
       0•0000      A
       2•0000      •
       0•0000      A
       5•0000      •
       0•0000      A
      14•0000      •
       4•0000      A
       4•0000      •
       2•0000      A
       2•0000      •
       3•0000      A
       2•0000      •
       3•0000      A
       2•0000      •
       2•0000      A
      17•0000      •
       3•0000      A
       7•0000      •
       2•0000      A
      37•0000      •
       0•0000      A
      11•0000      I◇
       9•0000      Σ◇
      20•0000      •
       2•0930      •
-      1•••••      •
      98•0000      •
    1996•0000      •
       8•9319      •
       4•9000      •
       0•7197      A
       9•0802      A
-      2•••••      •
      19•0000      •
      55•0000      •
       1•3945      •
       0•9500      •
       0•2973      A
       1•6026      A
-      3•••••      •
     117•0000      •
    2341•0000      •
```

```
        9•3373      •
        5•8500      •
        1•4800      A
       10•2199      A
  ...........       •

        0•0000      A
        2•0000      •
        6•0000      A
        1•0000      •
        1•0000      A
        0•0000      •
        1•0000      A
        2•0000      •
        2•0000      A
        0•0000      •
       34•0000      A
        2•0000      •
       18•0000      A
        0•0000      •
        3•0000      A
        3•0000      •
       33•0000      A
        1•0000      •
       35•0000      A
        2•0000      •
       62•0000      A
        0•0000      •
       40•0000      A
        1•0000      •
       17•0000      A
        2•0000      •
       23•0000      A
        4•0000      •
       61•0000      A
        3•0000      •
       51•0000      A
        3•0000      •
       39•0000      A
        2•0000      •
       80•0000      A
        2•0000      •
       36•0000      A
        3•0000      •
       55•0000      A
        5•0000      •
       61•0000      A
      108•0000      [illegible]   3
       20•0000      [illegible]   /
       20•0000      •
        2•0930      •
-       1•••••      •
       38•0000      •
      108•0000      •
        1•3726      •
        1•9000      •   peak
        1•2575      A
        2•5424      A
-       2•••••      •
      658•0000      •
    32392•0000      •   digi
       23•7794      •
       32•9000      •
       21•7709      A
       44•0290      A
-       3•••••      •
      696•0000      •
    35680•0000      •
       24•5584      •
       34•8000      •
       23•3064      A
       46•2935      A
  ...........       •
        2•0930      •
        0•0545      A
        0•9454      •
        0•0365      A
        0•0726      A
        0•9273      •
        0•9634      •
```

YEAR 1979
DATE 5-19
TIDE -0.1
TIME 12:22 PM

AT-8
19

WATER TEMP. ______
SALINITY ______
OTHER : ● Pachygrapsus BERM COUNT 24

STUDY SITE ______
TRANSECT AT-8
19

Balanus-Chthamalus
● BARNACLES
Littorina scutulata
ALGAE %
A. xanthogrammica
A. elegantissima
Pollicipes sp.
Pachygrapsus sp. / Hemigrapsus sp.
Cancer sp. / Pugettia sp. / Pagurus spp.
Mopalia sp.
Mytilus sp.
Platyodon sp.
Collisella spp. scabra / digitalis
Tegula sp.
Acanthina sp.
Pisaster sp.
Strongylocentrotus sp.
Littorina planaxis
COMMENTS

m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1						4			
	2	1					9			
	3	10					23			
	4						6			
	5						2			
2	6						15			
	7						9			
	8	35	7				3			
	9						1			
	10	60					10			
3	11						12			
	12						5			
	13	50	2				15			
	14	1					8			
	15	12	2				2			
4	16						2			
	17	35	9				3			
	18	10					5			
	19						27			
	20	20	1				4			
5	21	4					31			
	22	5	3				25			
	23	4	2				6			
	24	1					12			
	25						23			
6	26						7			
	27	15					8			
	28	125	6	3			6			
	29	80	5				16			
	30						5			
7	31	12	9				1			
	32	140	20				30			
	33	15	3				32			
	34	80	3				4			
	35	20	1				22			
8	36	200	60				24			
	37	180	9	4			27			
	38	5					9			
	39	120	4				10			
	40	250	20				8			
9	41	150	8				9			
	42	40	3				13			
	43	140	12				11			
	44	25	10				3			
	45	60	9				12			
10	46						14			
	47	110	25				18			
	48	15	4				7			
	49	30	2				4			
	50						13			

● m²		●	✕	✕ ●	✕✕✕	✕			●	✕					✕		COMMENTS m²
1 25									2 / 6								1
2 25									1 / 1								2
3 10									0 / 1								3
4 10		6							2 / 2								4
5 5									0 / 34								5
6 5		2		1					2 / 18								6
7									0 / 3								7
8 15		5							3 / 33								8
9 50									1 / 35								9
10 25									2 / 62								10

SIZE AVERAGE : 2-3 mm
% YOUNG :
P = PRESENCE
TW - 76 CUZ

BERM
LIT

```
     1•8     Φ  6
     1•9     Φ  6
-    5•19    Φ  6
     0•00    ^
        4•   •
        9•   •
       23•   •
        6•   •
        2•   •
       15•   •
        9•   •
        3•   •
        1•   •
       10•   •
       12•   •
        5•   •
       15•   •
        8•   •
        2•   •
        2•   •
        3•   •
        5•   •
       27•   •
        4•   •
       31•   •
       25•   •
        6•   •
       12•   •
       23•   •
        7•   •
        8•   •
        6•   •
       16•   •
        5•   •
        1•   •
       30•   •
       32•   •
        4•   •
       22•   •
       24•   •
       27•   •
        9•   •
       10•   •
        8•   •
        9•   •
       13•   •
       11•   •
        3•   •
       12•   •
       14•   •
       18•   •
     7•          •
     4•          •
    13•          •
     5•          •
     3•          •
     4•          •
    12•          •
     7•          •
     3•          •
     5•          •
    15•          •
    17•          •
     2•          •
     2•          •
     9•          •
     5•          •
     8•          •
    10•          •
     7•          •
    13•          •
     2•          •
     9•          •
     6•          •
    12•          •
    15•          •
     2•          •
     7•          •
     4•          •
     5•          •
     2•          •
     2•          •
    13•          •
     3•          •
    11•          •
     4•          •
    16•          •
     5•          •
     8•          •
    31•          •
     3•          •
     4•          •
     7•          •
    89•          t11  /
    11•          Σ11  /
   100•          A
     1•9600      •
-    1••••       •
   873•0000      •
 13879•0000      •
     7•9504      •
     8•7300      •
     7•1717      A
    10•2882      A
```

YEAR 1979
DATE 5-19
TIDE -0.1
TIME 12:22 pm

WATER TEMP.
SALINITY
OTHER :

STUDY SITE
TRANSECT AT-9
19

AT-9
19

BARNACLES: Balanus-Chthamalus; Littorina scutulata; ALGAE %; A. xanthogrammica; A. elegantissima; Pollicipes sp.; Pachygrapsus sp.; Hemigrapsus sp.; Cancer sp.; Pugettia sp.; Pagurus spp.; Mopalia sp.; Mytilus sp.; Platyodon sp.; Collisella sp. scabra digitalis; Tegula sp.; Acanthina sp.; Pisaster sp.; Strongylocentrotus sp.; Littorina planaxis; COMMENTS

m²	dm²	LIVE	DEAD	SCAR	mm SIZE		●			
1	1	18					5			
	2						3			
	3	20					4			
	4	50	4				12			
	5	80	2				7			
2	6	40	10	2			3			
	7	130	12				5			
	8	200	30				15			
	9	75	7				17			
	10	50	6				2			
3	11	11					2			
	12	30	2				9			
	13	180	70				5			
	14	300	25				8			
	15	75	18				10			
4	16	60	15				7			
	17	200	20				13			
	18						2			
	19	75								
	20	25	11				9			
5	21	30	4				6			
	22									
	23	8	1				12			
	24	160	20				15			
	25									
6	26	30	12				2			
	27									
	28						7			
	29	100	35				4			
	30									
7	31	8	2				5			
	32									
	33	30					2			
	34	40	3				2			
	35	360	24				13			
8	36	50	6				3			
	37	350	12				11			
	38									
	39	60	5				4			
	40	140	10				16			
9	41						5			
	42	175	35							
	43									
	44	20	1							
	45	150	11				8			
10	46	15	2				31			
	47	40	30				3			
	48	75	18				4			
	49	50	8				7			
	50	10	5							

● m²		●	×	●	●	×	×	●	×			●	●					×		COMMENTS	m²
1 25		14		4	1							0/40	12								1
2 25		4		2	1							1/17	1								2
3 10												2/23									3
4 5		2		3	1							4/61	29								4
5 10		2		3								3/51	49								5
6 25		2		2	6			1				3/39	59								6
7 15		17		3				2				2/80	62								7
8 15		7		2				1				2/36	46								8
9 50		37						4				3/55	57								9
10 75												5/61									10

SIZE AVERAGE : 2-3 mm   % YOUNG :

P = PRESENCE

TW - 76 CVL

YEAR 1979
DATE 5-19
TIDE -0.1
TIME 12:22 pm

WATER TEMP. ____
SALINITY ____
OTHER :

STUDY SITE ____
TRANSECT AT-10
19

AT-10
19

m²	dm²	BARNACLES Balanus-Chthamalus ● LIVE	DEAD	SCAR	mm SIZE		Littorina scutulata ●			
1	1	14	1				2			
	2	110	14	2			15			
	3	150	10				28			
	4						1			
	5	30	16				21			
2	6	60	15				18			
	7	40	2				23			
	8	160	35				22			
	9	100	5				18			
	10	125	22				6			
3	11						5			
	12	180	16				43			
	13	30	1				2			
	14	15	8				8			
	15	20	9				25			
4	16	25	30				17			
	17	24	5							
	18	16	2				13			
	19	12	4				8			
	20	75	15				10			
5	21									
	22	15								
	23	50					3			
	24						13			
	25	12	3							
6	26									
	27	5								
	28									
	29	7								
	30									
7	31									
	32	1								
	33									
	34									
	35									
8	36						5			
	37	4	2				8			
	38									
	39	10					2			
	40									
9	41	15					1			
	42	140	6				38			
	43	200	20				5			
	44	70	12				16			
	45	2	1				5			
10	46	24	3	2			1			
	47	30					11			
	48									
	49	8					11			
	50	110					13			

m² ●	ALGAE %	A. xanthogrammica ●	A. elegantissima ●	Pollicipes sp. ● / Pachygrapsus Hemigrapsus ×	Cancer sp. / Pugettia sp. / Pagurus spp. × × ×	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp. scabra / digitalis ●	Tegula sp. ●	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.		●	Littorina planaxis	COMMENTS	m²
1									7/32	3								1
2 5									8/95									2
3 20				1					1/16									3
4 1				1					1/15	1								4
5		2	134	2					6/84	22								5
6									0/0									6
7									6/8									7
8									1/66						1			8
9 1			238						24/90									9
10 1									3/158									10

SIZE AVERAGE : 2-3 mm   % YOUNG :   P = PRESENCE   TW-76 CUZ

```
        1•10        Φ 6
     1979•          Φ 6
-       5•19        Φ 6
        0•0000      ∧
            2•      •
           15•      •
           28•      •
            1•      •
           21•      •
           18•      •
           23•      •
           22•      •
           18•      •
            6•      •
            5•      •
           43•      •
            2•      •
            8•      •
           25•      •
           17•      •
           13•      •
            8•      •
           10•      •
            3•      •
           13•      •
            5•      •
            8•      •
            2•      •
            1•      •
           38•      •
            5•      •
           16•      •
            5•      •
            1•      •
           11•      •
           11•      •
           13•      •
           33•      t₀ /
           17•      Σ₀ /
           50•      A
        1•9600      •
-       1•••••      •
      417•0000      •
     8775•0000      •
       10•3974      •
        8•3400      •
        5•4579      A
       11•2220      A

        0•0000      ∧
      100•0000      •
      873•0000      •
    13879•0000      •
  •••••••••••       •
       50•0000      •
      417•0000      •
     8775•0000      •
  •••••••••••       •
      150•0000      •
        1•9600      •
-       3•••••      •
     1290•0000      •
    22654•0000      •
        8•8081      •
        8•6000      •
        7•1903      A
       10•0096      A
```

4T

STATS 50 test

```
       0•0000    Λ
       1•10      Ф 6
    1979•        Ф 6
-      5•19      Ф 6
       0•0000    Λ
          14•    •
           1•    A
         110•    •
          14•    A
         150•    •
          10•    A
          30•    •
          16•    A
          60•    •
          15•    A
          40•    •
           2•    A
         160•    •
          35•    A
         100•    •
           5•    A
         125•    •
          22•    A
         180•    •
          16•    A
          30•    •
           1•    A
          15•    •
           8•    A
          20•    •
           9•    A
          25•    •
          30•    A
          24•    •
           5•    A
          16•    •
           2•    A
          12•    •
           4•    A
          75•    •
          15•    A
          15•    •
           0•    A
          50•    •
           0•    A
          12•    •
           3•    A
           5•    •
```

```
               0•        A
               7•        •
               0•        A
               1•        •
               0•        A
               4•        •
               2•        A
              10•        •
               0•        A
              15•        •
               0•        A
             140•        •
               6•        A
             200•        •
              20•        A
              70•        •
              12•        A
               2•        •
               1•        A
              24•        •
               3•        A
              30•        •
               0•        A
               8•        •
               0•        A
             110•        •
               0•        A
              35•        †ıı   /
              15•        Σıı   /
              50•        •
          1•9600         •
-         1•••••         •
       1889•0000         •
     214701•0000         •   BAL
         54•0850         •
         37•7800         •   L
         22•7883         A
         52•7716         A
-         2•••••         •
        257•0000         •
       4691•0000         •
          8•2931         •   D
          5•1400         •
          2•8412         A
          7•4387         A
-         3•••••         •
       2146•0000         •
     268286•0000         •
         59•9625         •
         42•9200         •
         26•2992         A
       99•9407     A
•••••••••••        •
        1•9600     •
        0•8802     A
        0•1197     •
        0•8665     A
        0•8939     A
        0•1060     •
        0•1334     •


        0•0000     ∧
        0•0000     •
        1•0000     A
        0•0000     •
        1•0000     A
      134•0000     •
        2•0000     A
      238•0000     •
        0•0000     A
        4•0000     t()   /
        6•0000     Σ()   /
       10•0000     •
        2•2620     •
-       1••••      •
      372•0000     •
    74600•0000     •
       82•1662     •   Pol
       37•2000     •
-      21•5740     A
       95•9740     A
-       2••••      •
        4•0000     •
        6•0000     •   Pady
        0•6992     •
        0•4000     •
-       0•1001     A
        0•9001     A
-       3••••      •
      376•0000     •
    75142•0000     •
       82•3302     •
       37•6000     •
-      21•2914     A
       96•4914     A
•••••••••••        •


        0•0000     ∧
        7•0000     •
       32•0000     A
        8•0000     •
        95•0000        A
         1•0000        •
        16•0000        A
         1•0000        •
        15•0000        A
         6•0000        •
        84•0000        A
         0•0000        •
         0•0000        A
         6•0000        •
         8•0000        A
         1•0000        •
        66•0000        A
        24•0000        •
        90•0000        A
         3•0000        •
       158•0000        A
        10•0000        •
         2•2620        •
-        1••••         •
        57•0000        •
       773•0000        •
         7•0561        •
         5•7000        •
         0•6527        A
        10•7472        A
-        2••••         •
       564•0000        •
     55070•0000        •
        50•8378        •
        56•4000        •
        20•0353        A
        92•7646        A
-        3••••         •
       621•0000        •
     64377•0000        •
        53•5546        •
        62•1000        •
        23•7919        A
       100•4080        A
  ••••••••••••         •
         2•2620        •
         0•0917        A
         0•9082        •
         0•0655        A
         0•1179        A
         0•8820        •
         0•9344        •
```

Σ
Σx²
sd
$\bar{x}$

STATS2SP TEST

pcal

Tested STATS10 fincol app

digi

STATS10 test

YEAR 1979
DATE 6-15
TIDE -0.7
TIME 9:59 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT AT-7 19

AT-7 19

m²	dm²	Balanus-Chthamalus BARNACLES					Littorina sp.			
		LIVE	DEAD	SCAR	mm SIZE		●			
1	1						2			
	2						1			
	3						7			
	4						2			
	5						11			
2	6						5			
	7						4			
	8						2			
	9						1			
	10						8			
3	11						2			
	12						1			
	13						2			
	14						10			
	15						6			
4	16						7			
	17									
	18									
	19									
	20						15			
5	21									
	22									
	23									
	24						5			
	25						4			
6	26						19			
	27						2			
	28						3			
	29									
	30						2			
7	31						2			
	32									
	33						4			
	34						2			
	35						5			
8	36									
	37						3			
	38						8			
	39									
	40						7			
9	41						3			
	42						1			
	43						4			
	44									
	45						2			
10	46									
	47									
	48									
	49									
	50									

m²		A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.			COMMENTS	m²
m²		●		× ●	× × ●	×			●	●	●							m²
1		34			1				2	38								1
2		82		1	3				4	63								2
3		79			2				5	31								3
4		23			7				4	99	(1)							4
5		80			1				3	56								5
6		108							2	48	(1)							6
7		76							4	39								7
8		61			8				1	53								8
9		74			1				3	59								9
10																		10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUL

```
         1•7        Φ 6
         1•7        Φ 6
-        6•15       Φ 6
         0•0000     Λ
        34•0000     •
         1•0000     •
         2•0000     •
        37•0000     A
        38•0000     A
        82•0000     •
         4•0000     •
         4•0000     •
        90•0000     A
        63•0000     A
        79•0000     •
         2•0000     •
         5•0000     •
        86•0000     A
        31•0000     A
        23•0000     •
         7•0000     •
         4•0000     •
        34•0000     A
        99•0000     A
        80•0000     •
         1•0000     •
         3•0000     •
        84•0000     A
        56•0000     A
       108•0000     •
         0•0000     •
         2•0000     •
       110•0000     A
        48•0000     A
        76•0000     •
         0•0000     •
         4•0000     •
        80•0000     A
        39•0000     A
        61•0000     •
         8•0000     •
         1•0000     •
        70•0000     A
        53•0000     A
        74•0000     •
         1•0000     •
         3•0000     •
        78•0000     A
        59•0000     A
         9•0000     •
         2•3060     •
-        1•••••     •
       669•0000     •
     54561•0000     •
        24•5764     •
        74•3333     •
        55•4422     A
        93•2244     A
-        2•••••     •
       486•0000     •
     29426•0000     •
        19•9436     •
        54•0000     •
        38•6699     A
        69•3300     A
-        3•••••     •
      1155•0000     •
    153035•0000     •
        24•5203     •
       128•3333     •
       109•4853     A
       147•1813     A
  ••••••••••••      •
         2•3060     •
         0•5792     A
         0•4207     •
         0•5457     A
         0•6127     A
         0•3872     •
         0•4542     •
```

Peter

Tele

```
          1•7           Φ  6
          1•7           Φ  6
-         6•15          Φ  6
          0•0000        ^
         34•0000        •
          1•0000        A
         82•0000        •
          4•0000        A
         79•0000        •
          2•0000        A
         23•0000        •
          7•0000        A
         80•0000        •
          1•0000        A
        108•0000        •
          0•0000        A
         76•0000        •
          0•0000        A
         61•0000        •
          8•0000        A
         74•0000        •
          1•0000        A
          9•0000        •
          2•3060        •
-         1•••••        •
        617•0000        •
      47687•0000        •
         25•9524        •  AEL
         68•5555        •
         48•6068        A
         88•5043        A
-         2•••••        •
         24•0000        •
        136•0000        •
          3•0000        •
          2•6666        •  cmbs
          0•3606        A
          4•9726        A
-         3•••••        •
        641•0000        •
      50469•0000        •
         24•5345        •
         71•2222        •
         52•3633        A
         90•0811        A
••••••••••••••          •
          2•3060        •
          0•9625        A
          0•0374        •
          0•9452        A
          0•9798        A
          0•0201        •
          0•0547        •
          1•7        Φ  6
       1979•         Φ  6
-         6•15       Φ  6
          0•0000     ∧
          2•0000     •
          1•0000     •
          7•0000     •
          2•0000     •
         11•0000     •
          5•0000     •
          4•0000     •
          2•0000     •
          1•0000     •
          8•0000     •
          2•0000     •
          1•0000     •
          2•0000     •
         10•0000     •
          6•0000     •
          7•0000     •
         15•0000     •
          5•0000     •
          4•0000     •
         11•0000     •
          2•0000     •
          3•0000     •
          2•0000     •
          2•0000     •
          4•0000     •
          2•0000     •
          5•0000     •
          3•0000     •
          8•0000     •
          7•0000     •
          3•0000     •
          1•0000     •
          4•0000     •
          2•0000     •
         11•0000     Σ(1)  /
         45•0000     A
          1•9600     •
-         1•••••     •
        154•0000     •
       1088•0000     •
          3•5706     •
          3•4222     •
          2•3789     A
          4•4654     A
```

47

YEAR 1979
DATE 5-15
TIDE -1.0
TIME 8:31 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT BT-2
19

BT-2
19

P

m²	dm²	Balanus-Chthamalus BARNACLES LIVE	DEAD	SCAR	mm SIZE		Littorina sp. ●			
1	1						2			
	2									
	3						1			
	4									
	5									
2	6						3			
	7						5			
	8						13			
	9						1			
	10						2			
3	11						4			
	12						23			
	13						15			
	14						1			
	15						3			
4	16						38			
	17						20			
	18						34			
	19						5			
	20						1			
5	21						17			
	22						12			
	23						25			
	24						3			
	25						9			
6	26						24			
	27						18			
	28						31			
	29						9			
	30						42			
7	31						43			
	32						11			
	33						47			
	34						9			
	35						3			
8	36						29			
	37						14			
	38						2			
	39						15			
	40						7			
9	41						17			
	42						8			
	43									
	44						5			
	45						2			
10	46						5			
	47						9			
	48						1			
	49									
	50						4			

ALGAE % ● m²	A. xanthogrammica	A. elegantissima ●	Pollicipes sp.	Pachygrapsus sp. ✗	Hemigrapsus sp. ✗	Cancer sp. ✗	Pugettia sp. ✗	Pagurus spp. ●	Mopalia sp. ✗	Mytilus sp.	Platyodon sp.	Collisella spp. ●	Tegula sp. ●	Acanthina sp. ●	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	m²
1 85								1				17	76								1
2 85												13	56								2
3 90												11	40								3
4 80												28	40								4
5 80												39	38	3							5
6 75		1										21	30	1							6
7 80		41						1				19	67	1							7
8 95		11										17	55	1							8
9 95								1				31	35								9
10 95												14	30								10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUZ

YEAR 1979
DATE 5-15
TIDE -1.0
TIME 8:31 AM

WATER TEMP.
SALINITY
OTHER :

STUDY SITE
TRANSECT BT-3 19

BT-3 19

BARNACLES
Balanus-Chthamalus

ALGAE %
A. xanthogrammica
A. elegantissima
Pollicipes sp.
Pachygrapsus sp.
Hemigrapsus sp.
Cancer sp.
Pugettia sp.
Pagurus spp.
Mopalia sp.
Mytilus sp.
Platyodon sp.
Collisella spp.
Tegula sp.
Acanthina sp.
Pisaster sp.
Strongylocentrotus sp.

m²	dm²	LIVE	DEAD	SCAR	mm SIZE	● m²		●		× ×	× × ●	●		●	✗	●	✗	✗	COMMENTS	m²
1	1 2 3 4 5					1 99										22				1
2	6 7 8 9 10					2 99								4		30				2
3	11 12 13 14 15					3 99								10		28				3
4	16 17 18 19 20					4 99								7		21				4
5	21 22 23 24 25					5 98					2			4		24				5
6	26 27 28 29 30					6 85					1			6		18				6
7	31 32 33 34 35					7 90					2			5		25				7
8	36 37 38 39 40					8 95		1				1		4		31				8
9	41 42 43 44 45					9 95								3		18				9
10	46 47 48 49 50					10 95		10				1		1		16				10

SIZE AVERAGE :
% YOUNG :
P = PRESENCE
TW - 76 cvr

YEAR 1979
DATE 5-15
TIDE -1.0
TIME 8:31 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT BT-4
M

BT-4
19

BARNACLES
Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE
1	1				
	2				
	3				
	4				
	5				
2	6				
	7				
	8				
	9				
	10				
3	11				
	12				
	13				
	14				
	15				
4	16				
	17				
	18				
	19				
	20				
5	21				
	22				
	23				
	24				
	25				
6	26				
	27				
	28				
	29				
	30				
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

m² ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. / Hemigrapsus sp.	Cancer sp. / Pugettia sp. / Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	m²
●		●		✕✕	✕✕✕	●	✕		●	●	●							
1 40						6			65									1
2 50		3				11			60	2								2
3 90		1				5			27	1							1 k. tunicata	3
4 60		27				8			52									4
5 75		2				6			34		1							5
6 90		9				7			55									6
7 90		8				4			53	1								7
8 90		33				3			46	5								8
9 90		30				1			88	8								9
10 50		25				1			97	4								10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUL

YEAR 1979
DATE 5-18
TIDE -0.4
TIME 11:22 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-1 19

CT-1 19

BARNACLES: Balanus - Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE	● m²	ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. / Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
									●		XX	X	●	●	●			●	●	●				
1	1					1	99		28					14	2			26	18	9				1
	2																							
	3																							
	4																							
	5																							
2	6					2	99		20					11				19	3					2
	7																							
	8																							
	9																							
	10																							
3	11					3	70		1				1	7										3
	12																							
	13																							
	14																							
	15																							
4	16					4	20		3					13										4
	17																							
	18																							
	19																							
	20																							
5	21					5	90							4	1				14	1				5
	22																							
	23																							
	24																							
	25																							
6	26					6	99							3					2					6
	27																							
	28																							
	29																							
	30																							
7	31					7	98							6	1			1	5					7
	32																							
	33																							
	34																							
	35																							
8	36					8	99							2	1				1					8
	37																							
	38																							
	39																							
	40																							
9	41					9	97							2					4					9
	42																							
	43																							
	44																							
	45																							
10	46					10	98		1					8					2					10
	47																							
	48																							
	49																							
	50																							

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CWL

YEAR 1979
DATE 5-18
TIDE -0.4
TIME 11:22 AM

WATER TEMP. ________
SALINITY ________
OTHER : ● GIANT OWL LIMPET P

STUDY SITE ________
TRANSECT CT-2 19

CT-2 19

		BARNACLES Balanus-Chthamalus										A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. / Hemigrapsus sp.	Cancer sp. / Pugettia sp. / Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.				COMMENTS	
m²	dm²	LIVE	DEAD	SCAR	mm SIZE						m²	●					●	●		●	●	●							m²
1	1 2 3 4 5										1							312		215	6								1
2	6 7 8 9 10										2	7								49	44								2
3	11 12 13 14 15										3	6					1			34	50								3
4	16 17 18 19 20										4	18								24	28	2							4
5	21 22 23 24 25										5	10									3								5
6	26 27 28 29 30										6	6																	6
7	31 32 33 34 35										7	5																	7
8	36 37 38 39 40										8	1									3								8
9	41 42 43 44 45										9						1			2	4								9
10	46 47 48 49 50										10									7	22								10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUR

YEAR 1979
DATE 5-16
TIDE -0.9
TIME 9:25 AM

WATER TEMP. ____
SALINITY ____
OTHER :

STUDY SITE ____
TRANSECT CT-4 19

CT-4 19

		Balanus- Chthamalus ● BARNACLES				Mytilus sp.		Tegula sp.	Thais sp.	Littorina sp.
m²	dm²	LIVE	DEAD	SCAR	mm SIZE	●		●	●	●
1	1	30	5	6		11				
	2	120	60			9		1		
	3	100	10			12		2	1	
	4	50	20			9		3	1	
	5	20	40			14		1		
2	6	120	40	3		11		1		
	7	80	10			9		4		
	8	40	15			8				26
	9	100	25	2		15		3	1	1
	10	60	15	7		14		1		17
3	11	20	12			11		2		
	12	75	15	2		10		1	1	3
	13	40	8	2		16		2	2	
	14	50	5	7		19		1	1	
	15	20	4	5		10		1		
4	16	200	12			16		2	1	
	17	25				10		2		
	18	80	5			13				
	19	100		4		15		4	1	
	20	200	6			5		1	1	
5	21	40	5	2		21			8	
	22	200	60			16		1	2	2
	23	16				1		2		1
	24	80	14	2		8			2	5
	25	120	30			14		2	4	1
6	26	20	4	7		17			1	8
	27	50	8			17		1	1	3
	28	90	60			14			2	
	29	70	12	2		16		1		4
	30	80	10							8
7	31	30	5			7		2	1	
	32	150	20			8		2	1	
	33	60	8			9		3	1	
	34	70	4			15		3	1	
	35	40				8		1	1	2
8	36	150	20			19				
	37	50	4			15			1	
	38	30	20			14		1		3
	39	100	25			16		1		
	40	80	7	2		3			2	9
9	41	180	30			9		4	3	
	42	120	15			11		1	3	
	43	150	15			10		1		
	44	35	5			12				
	45	15				8		2		
10	46	300	25			25			1	4
	47	150	80			21			3	2
	48	150	60			19			2	10
	49	175	40			17		2	1	2
	50	40	12			15		2	1	3

ALGAE %	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.			COMMENTS
● m²			●	X ●	XXX		DEAD ●		●							m²
1 99			14		ǀǀ		7		25							ALGAE ON MUSSEL BED MOSTLY Endocladia AND Gigartina IN A 4:1 RATIO 1
2 40			7		ǀǀ		6		14							2
3 85			5		ǀǀ		10		22							3
4 90			6		ǀǀ		9		30							4
5 75			202		ǀǀ		4		18							5
6 25			16		ǀǀ		8		19							6
7 95			2	1	ǀǀ		15		21							7
8 85			11	2	ǀǀ		7		31							8
9 80					ǀǀ		8		35							9
10 30			36		ǀǀ		10		17							10

SIZE AVERAGE : 2-3 mm % YOUNG :

P = PRESENCE

TW-76 CUZ

YEAR 1979
DATE 5-16
TIDE -0.9
TIME 9:25 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-5 19

CT-5 19

BARNACLES Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE
1	1 2 3 4 5				
2	6 7 8 9 10				
3	11 12 13 14 15				
4	16 17 18 19 20				
5	21 22 23 24 25				
6	26 27 28 29 30				
7	31 32 33 34 35				
8	36 37 38 39 40				
9	41 42 43 44 45				
10	46 47 48 49 50				

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
m²	●			●	×	●	×	×							●			m²
1	7			1														1
2	9																	2
3	16														2			3
4	17					1									6		ONE Pisaster EATING ONE Cancer CRAB.	4
5	8					1									3			5
6	4														1			6
7	8					1												7
8	6																	8
9	12																	9
10	9																	10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUZ.

YEAR 1979
DATE 5-18
TIDE -0.4
TIME 11:22 AM

WATER TEMP. ______
SALINITY ______
OTHER :

STUDY SITE ______
TRANSECT CT-7 19

CT-7 19

● BARNACLES
Balanus-Chthamalus

m²	dm²	LIVE	DEAD	SCAR	mm SIZE					
1	1	120								
	2	30	1							
	3	7								
	4	1200	80	13						
	5	450	40	3						
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp.	Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.		Littorina sp.		COMMENTS	m²
		●		×	×	×	×	●				●	●	●				●			
1		4						8				395	232	49				3,800		MUCH ALGAE NUMEROUS YOUNG Tegula	1
2																					2
3																					3
4																					4
5																					5
6																					6
7																					7
8																					8
9																					9
10																					10

SIZE AVERAGE : 3-4 mm   % YOUNG :

P = PRESENCE

TW - 76 CWL

YEAR 1979
DATE 5-18
TIDE -0.4
TIME 11:22 AM

WATER TEMP. ______
SALINITY ______
OTHER : ● Saccoglossus sp. P

STUDY SITE ______
TRANSECT CT-12
19

CT-12
19

m²	dm²	BARNACLES Balanus-Chthamalus LIVE	DEAD	SCAR	mm SIZE					
1	1									
	2									
	3									
	4									
	5									
2	6									
	7									
	8									
	9									
	10									
3	11									
	12									
	13									
	14									
	15									
4	16									
	17									
	18									
	19									
	20									
5	21									
	22									
	23									
	24									
	25									
6	26									
	27									
	28									
	29									
	30									
7	31									
	32									
	33									
	34									
	35									
8	36									
	37									
	38									
	39									
	40									
9	41									
	42									
	43									
	44									
	45									
10	46									
	47									
	48									
	49									
	50									

m²	A. xanthogrammica	A. elegantissima	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp.	Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
1																	1
2																	2
3																	3
4																	4
5																	5
6																	6
7																	7
8																	8
9																	9
10																	10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW - 76 CUL.

no date

YEAR ______ WATER TEMP. ______ STUDY SITE A

DATE ______ SALINITY ______ TRANSECT 1

TIDE ______ OTHER :

TIME ______

		BARNACLES Balanus - Chthamalus				Littorina scutulata					
m²	dm²	[✓ LIVE]	[✓ DEAD]	SCAR	mm SIZE	*					
1	1										
	2										
	3										
	4										
	5										
2	6										
	7										
	8										
	9										
	10										
3	11										
	12										
	13										
	14										
	15										
4	16										
	17										
	18										
	19										
	20										
5	21										
	22										
	23										
	24										
	25										
6	26										
	27										
	28										
	29										
	30										
7	31										
	32										
	33										
	34										
	35										
8	36										
	37										
	38										
	39										
	40										
9	41										
	42										
	43										
	44										
	45										
10	46										
	47										
	48										
	49										
	50										

m²		A. xanthogramica	A. elegantissima	Balanus/Chthamalus	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettid sp. Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Littorina sp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS	m²
		*			*	*	*			*		*	*					
1																		1
2																		2
3																		3
4																		4
5																		5
6																		6
7																		7
8																		8
9																		9
10																		10

SIZE AVERAGE : % YOUNG : P = PRESENCE TW-75

YEAR
DATE 7/20/82
TIDE
TIME

WATER TEMP.
SALINITY
OTHER :

STUDY SITE A
TRANSECT 7

		Balanus - Chthamalus				
		BARNACLES				Littorina
m²	dm²	LIVE	DEAD	SCAR	mm SIZE	
1	1					8
	2					4
	3					0
	4					3
	5					1
2	6					4
	7					14
	8					13
	9					2
	10					10
3	11					10
	12					7
	13					8
	14					33
	15					12
4	16					13
	17					3
	18					16
	19					22
	20					3
5	21					52
	22					12
	23					14
	24					24
	25					33
6	26					47
	27					18
	28					16
	29					14
	30					30
7	31					52
	32					10
	33					80
	34					72
	35					53
8	36					36
	37					41
	38					26
	39					53
	40					60
9	41					15
	42					30
	43					42
	44					16
	45					26
~~10~~	46					18
	47					42
	48	not needed				39
	49					40
	50					50

m²	A. xanthogramica	A. elegantissima	Balanus/Chthamalus	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettid sp. Pagurus spp	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella sp.	Littorina spp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus sp.	COMMENTS
		★			★	★	★			★		★	★			
1		3			He 1	2 1	1			14		29	(2)			
2		2			0	1 1				28		50	(1)			
3		8			Pa 2	Pa. 6	1			51		39	(2)			
4		–			–	–	1			33		18	(1)			4
5		7			–	–	–			12		42	(3)			5
6		3			–	–	–			16		90	(2)			6
7		13				5				20		62	(2)			7
8		9				2				12		44	(6)			8
9					Pa 1	3	1			13		50	(5)			9
10		3			Pa 1	1	0			6		43	4.			10

SIZE AVERAGE :

% YOUNG :

P = PRESENCE

TW-75 CVZ

```
-       1•7        Φ 6
     1982•         Φ 6
-       7•20       Φ 6
          0•       ∧
          8•       •
          4•       •
          0•       •
          3•       •
          1•       •
          4•       •
         14•       •
         13•       •
          2•       •
         10•       •
         10•       •
          7•       •
          8•       •
         33•       •
         12•       •
         13•       •
          3•       •
         16•       •
         22•       •
          3•       •
         52•       •
         12•       •
         14•       •
         24•       •
         33•       •
         42•       •
         18•       •
         10•       •
         14•       •
         30•       •
         52•       •
         10•       •
         80•       •
         72•       •
         53•       •
         36•       •
         41•       •
         26•       •
         53•       •
         60•       •
         15•       •
         30•       •
         42•       •
         16•       •
         26•       •
         45•       A
      1•9600       •
-     1•••••       •
   1047•0000       •
  42021•0000       •
     20•0345       •
     23•2666       •    41
     17•4129       A
     29•1203       A
```

```
             1•7          Φ  6
          1982•           Φ  6
-            7•20         Φ  6
             0•0000       Λ
             3•0000       •
             3•0000       A
             2•0000       •
             0•0000       A
             8•0000       •
             8•0000       A
             7•0000       •
             0•0000       A
             3•0000       •
             0•0000       A
            13•0000       •
             5•0000       A
             9•0000       •
             2•0000       A
             0•0000       •
             4•0000       A
             8•0000       ħ11  /
             1•0000       Σ11  /
             9•0000       •
             2•3060       •
-            1••••        •
            45•0000       •
           385•0000       •
             4•4721       •    AFx
             5•0000       •
             1•5624       A
             8•4375       A
-            2••••        •
            22•0000       •
           118•0000       •
             2•8333       •    cub
             2•4444       •
             0•2665       A
             4•6223       A
-            3••••        •
            67•0000       •
```

```
  815•0000      •
    6•2871      •
    7•4444      •
    2•6117      A
   12•2771      A
•••••••••••••   •

    0•0000      A
    3•0000      •
    3•0000      •
   15•0000      •
   21•0000      A
   29•0000      A
    2•0000      •
    0•0000      •
   28•0000      •
   30•0000      A
   50•0000      A
    8•0000      •
    8•0000      •
   52•0000      •
   68•0000      A
   39•0000      A
    0•0000      •
    1•0000      •
   33•0000      •
   34•0000      A
   18•0000      A
    7•0000      •
    0•0000      •
   12•0000      •
   19•0000      A
   42•0000      A
    3•0000      •
    0•0000      •
   16•0000      •
   19•0000      A
   40•0000      A
   13•0000      •
    5•0000      •
   20•0000      •
   38•0000      A
   62•0000      A
    9•0000      •
```

```
           2.0000    .
          12.0000    .
          23.0000    A
          44.0000    A
           1.0000    .
           4.0000    .
          13.0000    .
          18.0000    A
          50.0000    A
           9.0000    .
           2.3060    .
-          1.....    .
         270.0000    .
       10140.0000    .
          15.9687    .
          30.0000    .
          17.7253    A
          42.2746    A
-          2.....    .
         374.0000    .
       16830.0000    .
          12.6896    .
          41.5555    .
          31.8014    A
          51.3096    A
-          3.....    .
         644.0000    .
       49368.0000    .
          20.2676    .
          71.5555    .
          55.9764    A
          87.1346    A
 ............        .
           2.3060    .
           0.4192    A
           0.5807    .
           0.3744    A
           0.4640    A
           0.5359    .
           0.6255    .

           4.6223    A
-          3.....    .
          67.0000    .
```

other

Teg

1.7 7/20/82

```
     0•0000      ^
    14•0000      •
    28•0000      •
    51•0000      •
    33•0000      •
    12•0000      •
    16•0000      •
    20•0000      •
    12•0000      •
    13•0000      •
     9•0000      A
     2•3060      •
     1•••••      •
   199•0000      •
  5783•0000      •
    13•1476      •
    22•1111      •
    12•0049      A
    32•2172      A
```

Cd

```
         5•1           Φ  6
      1982•            Φ  6
-        7•13          Φ  6

         0•0000        Λ
       600•0           •
        21•0           A
       800•0           •
        40•0           A
       350•0           •
        21•0           A
        23•0           •
         2•0           A
         7•0           •
         0•0           A
       134•0           •
         5•0           A
        60•0           •
        20•0           A
        18•0           •
         0•0           A
        70•0           •
         0•0           A
       500•0           •
        20•0           A
       250•0           •
        15•0           A
        20•0           •
        10•0           A
         0•0           •
        10•0           A
        65•0           •
        15•0           A
       210•0           •
        15•0           A
       220•0           •
        15•0           A
       225•0           •
        15•0           A
        17•0           t()   /
        13•0           Σ()   /
        30•            •
      1•9600           •
-     1•••••           •
   3552•0000           •
 1610108•000           •
    202•5314           •
    118•4000           •
     45•9250           A
    190•8749           A
-     2•••••           •
    224•0000           •
   4636•0000           •
     10•1088           •
      7•4666           •
      3•8492           A
     11•0840           A
-     3•••••           •
   3776•0000           •
 1771976•000           •
    211•4566           •
    125•8666           •
     50•1978           A
    201•5354           A
 ••••••••••••          •
      1•9600           •
      0•9406           A
      0•0593           •
      0•9331           A
      0•9482           A
      0•0517           •
      0•0668           •
      5•1          Φ  6
   1982•           Φ  6
-     7•13         Φ  6
      0•0000       ∧
          2•       •
          3•       •
          6•       •
         18•       •
         15•       •
          3•       •
          7•       •
          5•       •
         15•       •
         10•       •
         10•       •
         10•       •
          5•       •
         23•       •
         14•       ↑n  /
         16•       Σn  /
         30•       A
     1•9600        •
-    1•••••        •
   132•0000        •
  1760•0000        •
     6•3766        •
     4•4000        •
     2•1181        A
     6•6818        A

     0•0000        ∧
     4•0000        •
     7•0000        •
     4•0000        •
     1•0000        •
     2•0000        Σn  /
     6•0000        A
     2•3650        •
-    1•••••        •
    16•0000        •
    82•0000        •
     2•8047        •
     2•6666        •
-    0•0413        A
     5•3746        A
  3-29-32

  • • • • • • 2
  • • • • 0,39
2 • • • • 0,7
  • • • • • • 2
  • • • • 0,39
1⅓ • • • 1,93
2 • • • • 1,39
  • • • • • • 2
2 • • • • 2,05
1⅓ • • • 4,18
* • • • • 8,38
* • • • • 6,1
* • • • • 0,37
* • • • • 5,27
* • • • • 4,2
```

YEAR 1982
DATE July 13
TIDE 0.8 @ 11:06
TIME 11:30

WATER TEMP. 16.8 °C
SALINITY 28 ‰
OTHER: pH 5.5

~~[illegible]~~ =

STUDY SITE Ft. BAKER
TRANSECT

		BARNACLES Balanus - Chthamalus			
m²	dm²	LIVE	DEAD	SCAR	mm SIZE
1	1	0	0	2	3
	2	0	0	0	
	3	0	0	0	
	4	0	0	0	
	5	0	0	0	
2	6	600	21	3	3
	7	800	40	0	3
	8	350	21	6	3
	9	23	2	0	3
	10	7	0	0	3
3	11	134	5	18	3
	12	60	20	15	3
	13	18	0	3	3
	14	70	0	7	3
	15	500	20	0	3
4	16	250	15	5	3
	17	20	16	15	3
	18	0	10	10	3
	19	65	15	10	3
	20	210	15	10	3
5	21	220	15	5	3
	22	225	15	23	3
	23	0	0	0	0
	24	0	0	0	0
	25	0	0	0	0
6	26	0	0	0	0
	27	0	0	0	0
	28	0	0	0	0
	29	0	0	0	0
	30	0	0	0	0
7	31				
	32				
	33				
	34				
	35				
8	36				
	37				
	38				
	39				
	40				
9	41				
	42				
	43				
	44				
	45				
10	46				
	47				
	48				
	49				
	50				

m² / % ALGAE	A. xanthogramica	A. elegantissima	Balanus/Chthamalus	Pollicipes sp.	Pachygrapsus sp. / Hemigrapsus sp.	Cancer sp.	Pugettia sp. / Pagurus spp	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Littorina sp.	Tegula sp.	Acanthina sp.	Pisaster sp. Ochraceous	Strongylocentrotus sp.	COMMENTS	m²
1 0					0			1			0	0						1
2 2					4			0			18	58						2
3 10					7			0			5	14						3
4 10					0			0			50	160						4
5 20					3 P.C. 1 H.n			0			30	150						5
6 85	1				1 P.C.			1			20	100		1			(1) Idothea sp.	6
7																		7
8																		8
9																		9
10																		10

SIZE AVERAGE:

% YOUNG:

P = PRESENCE

TW-75 CVZ

YEAR 1983
DATE Feb 4, 1983
TIDE 0 41.2
TIME @ 11:18AM

WATER TEMP. 52°F
SALINITY 25 0/00
OTHER : Clear weather

STUDY SITE Stinson @ Boyle's
TRANSECT place.

Boyle's Transect pins washed away, Jan 27, 1983 by hi tides

m²	dm²	BARNACLES Balanus - Chthamalus LIVE	DEAD	SCAR	mm SIZE		No worms nor Emerita				Mysid shrimps
1	1										
	2										
	3										
	4										
	5										
2	6										
	7										
	8										
	9										
	10										
3	11										
	12										
	13										
	14										
	15										
4	16										
	17										
	18										
	19										
	20										
5	21										
	22										
	23										
	24										
	25										
6	26										
	27										
	28										
	29										
	30										
7	31										
	32										
	33										
	34										
	35										
8	36										
	37										
	38										
	39										
	40										
9	41										
	42										
	43										
	44										
	45										
10	46										
	47										
	48										
	49										
	50										

m²	A. xanthogramica	A. elegantissima	Balanus/Chthamalus	Pollicipes sp.	Pachygrapsus sp. Hemigrapsus sp.	Cancer sp. Pugettia sp.	Pagurus spp.	Mopalia sp.	Mytilus sp.	Platyodon sp.	Collisella spp.	Littorina sp.	Tegula sp.	Acanthina sp.	Pisaster sp.	Strongylocentrotus s	COMMENT
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Beach littered with algae + debris
no organisms for
10 M²

present in low pools

SIZE AVERAGE :

% YOUNG :

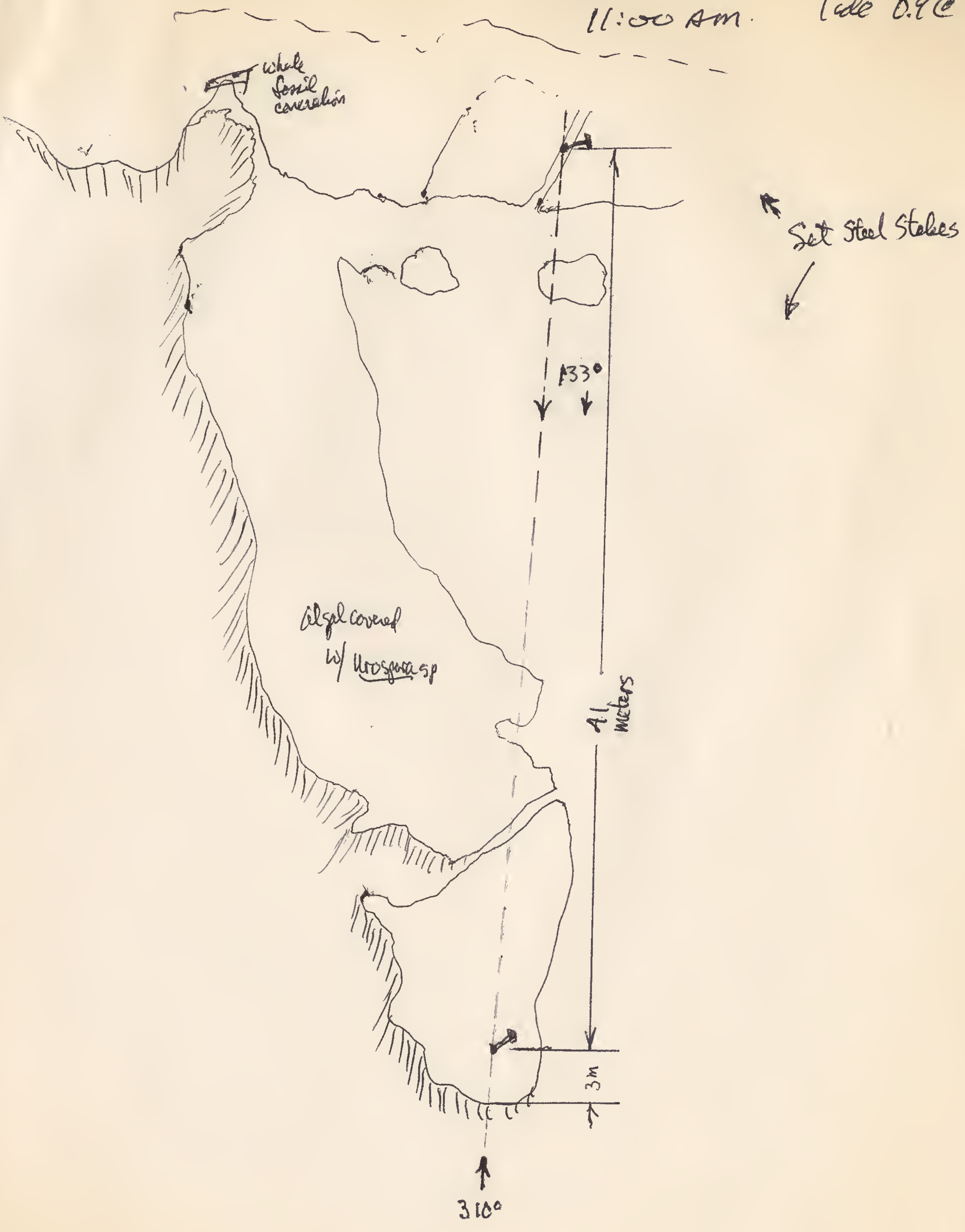
P =

TW-75

Drake's Beach Transect

Feb 5, 1983
11:00 AM.

Tide 0.9@ 12:29pm
G.G.



Abbott's Lagoon
Feb 5, 1983
2:00 pm
Tide: 0.9 @ 12:29 pm